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The New Year

AGAIN comes a New Year with its opportunities, ambitions and promise. Our good wishes would further them all. Looking forward, the coming year bids fair to be the most notable in accomplishment that the rubber industry has ever enjoyed.

ACCURATE TIRE STATISTICS IMPERATIVE

ONE QUESTION which profoundly concerns all tire manufacturers, and urgently seeks solution, is: How may the industry fairly determine what is overproduction, and how shall it settle with reasonable certainty what is underconsumption? In other words, is it possible for the leaders by acting in concert to strike the golden mean, and to so stabilize the industry that tire making will easily, elastically, and in a sense automatically adapt itself to the ever-varying conditions of supply and demand?

One of the most practical steps taken thus far in the direction of reaching this consummation is that of assembling statistics of the production, shipment, and inventory of pneumatic tires, tubes a d solid tires, as well as the amount in pounds of cotton fabric and crude rubber consumed in such production each month. In the opinion of the Tire Manufacturers' Division of The Rubber Association of America, which has begun to collect such valuable data from its members, this information will be of vital benefit to every tire manufacturing concern in estimating how the demand for tires already made and unsold will be taken care of, and will go a long way in guiding it toward normal production of tires at any time.

Inasmuch as other great industries reap a considerable advantage from similar statistical service, why should not rubber manufacturers, methodical enough in the conduct of their own separate affairs, pursue a like course, and thereby save themselves many missteps and much lost motion?

Most tire manufacturers will be found very willing to supply all the desired facts, for they are assured that the utmost pains will be taken to prevent the misuse of this confidential information. Each one will be given a code number to insure secrecy, no names whatever being used in the reports. The data supplied will be so well guarded that even the smallest manufacturer need have no timidity about supplying his share. In this way an aggregate will be obtained that will be of great value to the trade. Indeed, such an important undertaking is only possible when conducted under the auspices of a great organization which has no "ax to grind" and no ulterior purpose to serve, but seeks only the utmost welfare for every division of the rubber industry.

SEASONAL RUBBER GOODS

THE very excellent brief submitted to the Federal Trade Commission by George H. Mayo, John Kearns and Charles Neave, for The Rubber Association of America on price protection for seasonable rubber goods, specifically footwear and tires, is an exceedingly able and convincing document.

As one reviews the world's rubber products, the arguments in this brief apply to many goods other than the two lines mentioned. For example, in the mechanical rubber goods line, there are garden hose, jar rings, thresher belts, and a great variety of lesser rubber appliances that go toward agricultural machinery and that enter into the canning and packing industries.

In rubber clothing, there are also surface coats, mackintoshes, camping blankets, auto tops, bathing caps and suits, and a variety of lesser articles.

When one turns to sporting goods, there are golf balls, football bladders, and a vast variety of lesser sporting articles.

The insulated wire industry is also interested through the wiring used in automobiles. So, also, the hard rubber industry, in the great volume of battery jars that are made for automobiles.

With still finer analysis, one might suggest that hot-water bottles, inasmuch as they are used for foot warming, are seasonal goods.

In other words, the vast majority of rubber goods, probably 90 per cent, go directly into this category, which is why the brief has such sweeping application, and why the trade should congratulate itself that it was so well prepared.

WILL $3 RUBBER COME AGAIN?

THE long-impending restriction in rubber production by the owners of the great plantations of the Far East is an accomplished fact, the proprietors of fully 80 per cent of the 3,000,000 planted acreage having accepted the recommendation of the council of the Rubber Growers' Association, of London, to curtail by 25 per cent the estimated normal monthly output, either by leaving untouched one-quarter of the tapping area or by tapping the trees in the entire tapping area only on alternate days. Planters are free to choose either method to limit the total output. The "Covenant of the League" provides that the repression period shall extend from November 1, 1920, to January 1, 1922; but the time and terms of the restriction may be modified by mutual agreement whenever improved economic conditions, such as a considerable reduction in excess stocks, warrant such action.

Rubber planters feel amply justified in taking this course toward stabilizing the market for raw gum, which has been severely jolted by a combination of adverse conditions, among them being drastic credit regulations by leading banking institutions of the world to check inflation, labor troubles, demoralization of European trade, and the chaotic condition of the world's exchanges. All this came instead of the predicted post-war boom in rubber, and to mock the predictions of the too optimistic. Yet even the most conservative planters never dreamed of the price dropping to 10 pence (normal exchange), as it did recently in the London market, and which figure, while not below cost of production, does not show much profit.

Naturally, students of the rubber industry cannot help but speculate on the probable outcome of the decision of the plantation owners to curtail their output. Will not history repeat itself in this case as it has in so many others? Very likely a diminished production of crude rubber will raise the price before long in accord with the workings of the law of supply and demand, but at best this benefit can only be temporary. Attracted by the enhancing prices, and willing to take a chance where the profits are promising, enterprising capitalists are likely to go heavily into raising rubber, and there is still a vast available territory to be exploited. Hence, with much crude gum pressing for sale, the inevitable will happen, just as it did following the excessive production on the advent of the tire industry, and prices will drop sharply.

Rubber may some day again approximate the $3 mark; but concerted curbing of production will not bring it about, nor will artificial restriction of sales do it, as the woeful collapse of famous rubber "corners" has well proved. Nor is another sudden and extraordinary demand for rubber, with swift price enhancement, such as came with the inception of the tire industry, at present in sight. Wherein then lies the planter's opportunity to get higher prices with a ready market? He may reach such a goal by producing a type of rubber better than that of his competitors, always homogeneous and up to sample; by accepting the low prices, but producing a good grade of gum at reduced cost with improved methods; or by finding some wholly new use for rubber on a considerable and increasing scale.

TIRE VALUES VASTLY INCREASED

ESTIMATED in terms of miles per dollar of cost, the rubber tire of today is cheaper by 50 per cent than the tire of ten years ago, which is but another way of saying that the tire buyer gets more for his money now than ever before. Indeed, no other manufactured commodity in America has undergone as great an improvement in quality and workmanship as the pneumatic tire. Five years ago the maximum mileage guaranty was 3,500, and that was on the more expensive tires. Today, even on low-priced tires a 7,000-mile guaranty is commonly given. Yet, while tires have gradually declined in price, tire fabrics have, in the past ten years, fairly quadrupled in value. Crude rubber took an opposite course, falling in 1920 to a quarter of the 1910 price. The leading tire makers, however, are constantly experimenting, and are doing their utmost to build more miles into their tires so that any loss to buyers will be relative rather than absolute.

RUBBER AND WHISKEY

A CORRESPONDENT to the *Financial Times*, London, pointing to the low price of crude rubber, says: "In 1913 a pound of rubber would pay for a bottle of whiskey (a quart); today it would take nine pounds of rubber to buy a bottle of whiskey." A very clever presentment but not particularly valuable as an asset in comparative statistics, particularly in the United States, where whiskey and rubber conditions run thus: In 1913 a pound of rubber would buy a bottle of whiskey (a pint). Today the Bootleggers' Union would exact twenty-two pounds of rubber for a pint of whiskey, and both buyer and seller would be taking chances at that.

WHAT IS NOW REQUIRED IS COURAGE AND RESPECT FOR fundamental economic principles. Artificial palliatives to obviate the difficulties of adjustment—particularly proposals involving further inflation and cheapening of credit—must be avoided.

A Glossary of Words and Terms Used in the Rubber Industry

By Henry C. Pearson

THAT a great industry, the most individual in existence, should create its own technical terms and constantly coin new ones is inevitable. That such terms should demand classification, definition and standardization is evident. Up to the present time, however, the exact definition of words, terms, and phrases in common use in rubber manufacture has been lacking. The few attempts that have been made towards such definitions have perhaps pointed the way, but were abandoned before completion.

With a certain reluctance, but in response to many requests, the Editor of THE INDIA RUBBER WORLD has assumed the task of rubber dictionary making. The purpose of publishing the definitions in instalments in the pages of this magazine is to invite criticism, additions and suggestions. In other words, all who are interested are invited to become collaborators in this important work. It should be noted that the plan is not to explain words with encyclopedic completeness, but rather to furnish brief and accurate descriptive definitions that will perhaps in time become standard.

Words and terms in general use will be given, and certain obsolete words as well, provided they have an explanatory or historic value. It is planned to cover in this work not only words relating to crude rubber, but those used in the various lines of manufacture into which the rubber industry is divided.

INDIA RUBBER ($C_{10}H_{16}$). An elastic gum produced—

(a) By the coagulation of the milk or latex of various trees, vines, shrubs and plants.
(b) By extraction from the tissues of certain non-lactiferous vines and shrubs.
(c) Chemically from various bases, as isoprene.

Called india rubber (indian rubber) by Priestley in 1772, because pieces of the gum from India were found excellent for rubbing out pencil marks.

India rubber is called in French, cacoutchouc; in Italian, cautschouc; in German, kautschuk or gummi; in Spanish, caucho; in Portuguese, xirringa or borracha; in Latin, gummi elasticum.

There are about a hundred species of plants belonging to numerous families from which india rubber is obtained commercially. In most of these rubber is found in the milk or latex (numerous globules suspended in a watery fluid) occurring in small tubes located chiefly in the bark. This latex is obtained by cutting incisions in the bark. The change from the liquid to the solid caoutchouc, called coagulation, is without much alteration of the composition other than the elimination of water. It is accomplished mainly by smoking, by acids, by alkaline or astringent plant juices or by air drying. Rubber from non-lactiferous plants is extracted by simple mechanical means or by the destruction of the wood fiber by chemicals.

SYNONYMS AND GENERAL TERMS

RUBBER. A common term for india rubber, but lacking in exactness as the same word has various other meanings.

AFRICAN RUBBER. Crude rubber from the continent of Africa and the island of Madagascar.

ALLIED GUMS. See Pseudo rubbers.

AMERICAN RUBBER. Crude rubber produced in any part of North, South or Central America or the islands adjacent thereto.

ARTIFICIAL RUBBER. Applied strictly, refers to synthetic rubber, Is widely used, however, in describing products termed rubber substitutes.

ASIATIC RUBBER. (East Indian Rubber.) Crude rubber from Malaya, India, the Netherland East Indies, Borneo and the Philippine Islands.

AUSTRALIAN RUBBER. Wild crude rubber from New Caledonia and Oceanica.

BLENDED RUBBER. A term used by Huber to designate rubber made from a mixture of latices as *Hevea* and *Sapium*. In manufacturers' parlance, a mixture of different grades by massing on heated rolls.

CAOUTCHOUC. Probably derived from the South American Indian word cahuca, generally used by the French and to a degree by the English writers.

CENTRAL AMERICAN RUBBER. Crude rubber from the *Castilloa* (not including caucho), produced in Mexico, Central America, and some of the northern states of South America.

CEYLON RUBBER. A term formerly applied to plantation rubber of Asiatic origin. Now confined to the rubber produced on the Island of Ceylon.

COAGULATED RUBBER. Rubber derived from the milk or latex of plants.

COMMERCIAL RUBBER. See Crude Rubber.

CRUDE RUBBER. A trade term for all grades of uncompounded rubber.

DERESINATED RUBBER. In highly resinous rubbers the resin and the rubber are separated, the two crude products being marketed, one as rubber resin, the other as deresinated rubber.

DRY RUBBER. A selling term that means comparatively dry, and refers to old, wild rubber.

EAST INDIA RUBBER. See Asiatic Rubber.

ELASTIC RESIN. A common term for rubber among the early investigators.

EXTRACTED RUBBER. Rubber extracted from the bark or tissues of plants, not latex producers.

GUM ELASTIC. An excellent descriptive name used by Charles Goodyear.

INDIAN RUBBER. See India Rubber.

JAVA RUBBER. At one time the term under which East Indian rubber from the *Ficus elastica* was generally known—also called Assam rubber.

LARD RUBBER. An obsolete term for Central American rubber.

LIQUID RUBBER. Hancock's designation of rubber latex. Also used as descriptive of certain fluxes used in compounding.

NATURAL RUBBER. The product of trees, vines, shrubs, and plants only.

NEW RUBBER. Rubber that has been recently coagulated.

OLD RUBBER. Rubber that has been long in storage or transit. Used also to designate vulcanized scrap.

PLANTATION RUBBER. Rubber produced by cultivation, chiefly from the *Hevea* species, but also includes the product of planted *Castilloa, Manihot, Ficus, Funtumia,* etc.

POLYPHRENE. A descriptive name suggested by the late Dr. Carl Otto Weber.

PSEUDO RUBBERS. (Allied gums.) Resinous gums that contain neither rubber nor gutta percha, but are used in compounding.

PURE GUM. See Pure Rubber.

PURE RUBBER. (Pure gum.) Commercially; rubber that contains no admixtures other than ingredients anecessary for vulcanization or for solution and vulcanization. Chemically; rubber from which all moisture, resins, proteids, etc., have been removed.

RAW RUBBER. See Crude Rubber.

RESIN RUBBER. An obsolete term for jelutong or Pontianak.

RUBBER LATEX. (Rubber milk.) A watery fluid varying in color from white to amber, contained in the bark, leaves and to a degree in the cellular tissue of plants. In density it varies from that of a thin fluid like skim milk to thick cream. Its specific gravity varies from 1.02 to 1.41. A typical analysis of *Hevea* latex is: water 56 per cent; albuminoid extracts, etc., 12 per cent; india rubber 32 per cent.

RUBBER RESIN. See Deresinated rubber.

SOUTH AMERICAN RUBBER. Crude rubber produced in South America. The name was first applied to Fará rubber, but later extended to embrace caucho, Ceará and mangabeira sorts.

SYNTHETIC RUBBER. An artificial rubber or rubber-like substance produced from isoprene, homologous hydrocarbons, or the like.

WASHED RUBBER. Grades of crude rubber wholly or partially cleansed by washing with water.

WEST INDIAN RUBBER. See Central American Rubber.

WEST INDIAN RUBBER. *Castilloa* rubber from Central or South America, shipped from ports in the West Indies.

WILD RUBBER. A commercial term descriptive of rubber collected from uncultivated plants by native methods. The product is received in a variety of shapes, is not uniform and often contains bark, sand and adulterants.

The forms in which wild rubber comes to market are:

BALLS. Irregular, round or oval shaped masses of rubber, running from half an inch in diameter to two feet or more. Small flattened balls are also called buttons. Balls from half an inch to two inches in diameter are often designated as marbles. Large balls, as smoked-cured Pará are known as pelles, biscuits, hams. Large balls of air-cured rubber, as coarse Pará, are called heads, or negro heads.

BISCUITS. Another name for pelles, also applied to oblong cakes cut from lumps.

BOTTLES. Fine or medium Pará made up in bottle-shaped pelles. Not practiced at present.

BUTTONS. Balls of a small size, slightly flattened.

CAKES. Irregularly, round, flat disks.

CLUSTERS. Small balls adhering in masses of varying size and shape.

FLAKES. Thin irregular sheets.

HEADS. Large balls made by compressing masses of rubber together, forming an adhesive mass. (Negro heads.)

LUMPS. Large pieces, varying in size and of irregular shapes, weighing from 20 to 100 pounds. Before shipment, lumps are often cut up into buttons and strips.

MARBLES. Similar to balls, but of a diminutive size.

NIGGERS. Balls which have been kneaded into different sized masses so that the original shape has disappeared.

NUTS. Another name for thimbles.

OYSTERS. Irregular, thin sheets hanging together like the two halves of an oyster.

PASTE. Masses of soft, semi-fluid rubber.

SAUSAGE. Rubber which has been rolled or wound into finger or sausage shapes.

SCRAPS. Small pieces of rubber of a variety of shapes, usually lumped together into large balls.

SHEETS. Thin, flat, rectangular plates.

SLABS. Very thick, rectangular sheets.

SPINDLES. Threads of rubber which have been wound about a stick which is later removed by cutting open the mass.

STRIPS. Long, narrow thongs of rubber of varying length and thickness.

THIMBLES. Cubes about an inch for each dimension.

TONGUES. Small, oval sheets.

TWISTS. Threads of rubber wound into balls.

To be continued

The Manufacture of Balata Belting

BALATA BELTING was first manufactured by R. & J. Dick, of Glasgow, Scotland, about 1884 and patented by them in the following year. Since that time it has been demonstrated to be of special value under certain exacting conditions of service in power transmission.

The foundation of balata belting is heavy cotton duck impregnated with balata gum and plied together. The processes of working balata have some resemblance to those used in rubber manufacture, the chief difference perhaps being the omission of vulcanization, for balata is not vulcanizable but, like gutta percha, is plastic at the temperature of boiling water and at ordinary temperatures is firm and possessed of great tensile strength but not much elasticity. These characteristics necessitate special departures in the methods of working balata.

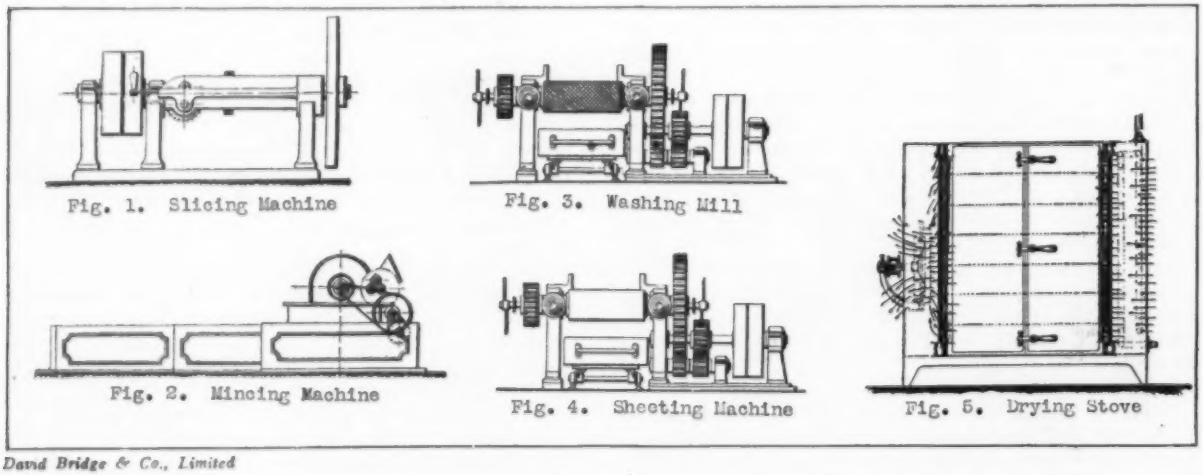

Fig. 1. Slicing Machine

Fig. 2. Mincing Machine

Fig. 3. Washing Mill

Fig. 4. Sheeting Machine

Fig. 5. Drying Stove

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PREPARATION OF BELTING DUCK

The duck employed in balata belting may be of the weights used in ordinary rubber belting, namely, from 28 to 32 ounces per square yard. Before treatment with balata composition, however, it is necessary that all oily matters and sizing contained in it be wholly removed. For this purpose it is placed in a dyer's vat with a solution of soda crystals and boiled a couple of hours by the injection of steam. To facilitate the extraction of foreign matter the duck is reeled through the bath by a hand-operated reel mounted on the vat.

On this reel it is allowed to drip previous to subsequent drying in a dry loft and final drying on a triple-cylinder power dryer, from which it is delivered bone dry, ready for impregnation with balata.

PREPARATION OF BALATA

Balata is a non-vulcanizable gum of the gutta variety derived from the "bully" or "bullet" tree, *Mimusops balata*. It is found in several South American countries, particularly in the Guianas and Venezuela. Crude balata as received comes in the form of blocks or sheets. Both forms contain such impurities as wood, sand and moisture which must be removed by washing. Balata sheets contain 10 to 15 per cent of moisture and the blocks from 30 to 35 per cent. The removal of the impurities is effected by a method resembling that used in cleaning wild rubber.

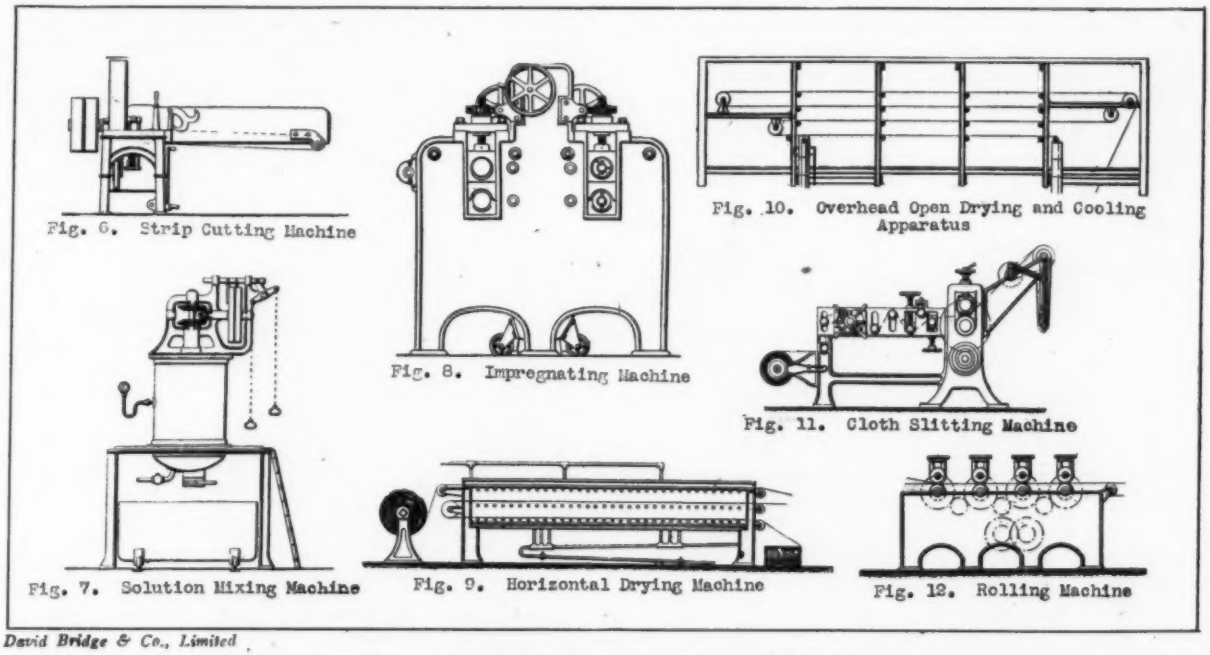

Fig. 6. Strip Cutting Machine

Fig. 8. Impregnating Machine

Fig. 10. Overhead Open Drying and Cooling Apparatus

Fig. 11. Cloth Slitting Machine

Fig. 7. Solution Mixing Machine

Fig. 9. Horizontal Drying Machine

Fig. 12. Rolling Machine

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The stiff crude gum is first put through a slicing machine, Fig. 1, which reduces it to convenient form for the next operation of softening it in tanks of boiling water heated by steam. Under this treatment the gum becomes very soft and plastic, permitting the inclosed foreign matters to be readily brought to the surface and removed by the subsequent cleaning operations.

The first of these is washing in a specially adapted machine, substantially in effect a Hollander or so-called paper engine, Fig. 2. This consists of a large tank with a central vertical portion and at the side, on one end, a heavy revolving cylinder provided with knife edges working shear-like with a fixed cutting edge under water, past which the softened balata passes with the current of water set in motion by the wheel mentioned

The balata is mechanically fed to the revolving cutters of this machine by a special roller feed and after cutting it is delivered into the tank below, where it is subjected to agitation in warm water, so that the wood and other impurities are separated. The light-gravity material floats away on the surface while the sand and earth sink to the bottom.

The partly cleaned gum is taken next to a washing mill, Fig. 3, resembling that commonly used for crude rubber. It differs by having under it instead of a screen or mill pan a portable tank-like pan mounted on a truck that runs on a track. This affords a bath of warm water for retaining the balata in a workable state of plasticity. The washer mill rolls are corrugated and have a differential speed for tearing apart the gum, while an overhead supply of water descends and washes out the impurities brought to the surface by the milling.

Having been thoroughly freed of foreign matters in the washing mill the balata passes next to a sheeting machine, Fig. 4, with rolls of equal speed, in which it is rolled out into thin sheets preparatory to the next operation. In the illustration it will be seen that the sheeting mill, like the washer, is provided with a pan mounted on rails, serving the same purpose.

Before compounding and making the solution it is essential, as in rubber working, that all moisture be eliminated from the gum. The clean sheets are, therefore, taken from the sheeter direct to an oven or drying stove, Fig. 5. This is a chamber provided with shelving to receive the stock, and operates by a fan-actuated system of ventilation in which air at suitable temperature is drawn in at one side and expelled moisture-laden from the other. The thoroughly dry sheets are prepared for solution and compounding by passing through the strip-cutting machine, Fig. 6, in which they are reduced to thin strips to render the gum more readily soluble.

The solution-mixing machine, Fig. 7, consists of a vertical steam-jacketed power churn. The clean, dry, thin balata strips are placed in the mixer with the solvent and fillers, which may include such materials as regenerated balata, oxides, carbonates, resins and coloring matters. In the mixer the process of solution is effected by paddles rotating in opposite directions, while the materials are maintained at about 90 degrees F. by steam circulation in the outer jacket. When ready for use the charge is received in an open tank car placed under the mixer which is discharged through a quick-opening gate-valve.

At this point in the manufacture of balata belting comes the process of impregnation of the duck employed.

IMPREGNATION BY SOLUTION

English and American practices differ from the French in the method used for applying the balata to the fabric. The English and American processes deal directly with the compounded solution from the mixer in a machine of the type illustrated in Fig. 8, which shows an end view. The arrangement consists of two pairs of pressure rollers, through one pair of which the dry duck to be impregnated is passed down into the prepared balata solution contained in a V-shaped truck tank run under the machine. The entire structure of the duck is thus filled with the gum preparation and the excess is removed by the second pair of pressure rollers and returns to the tank.

The solvent which saturates the impregnated fabric is ex-

pelled by the horizontal drying apparatus, Fig. 9, which is essentially a horizontal multiple-deck steam-pipe dryer, through which the fabric is run and the solvent expelled.

Final thorough drying and cooling require that the coated fabric be passed also through a vertical dryer and lastly on an overhead, open drying and cooling apparatus, Fig. 10. From the latter apparatus the coated duck issues ready for the belting making-up processes.

IMPREGNATION BY SPREADING MACHINE

The French system of impregnating duck with balata is by the use of the ordinary spreader. As in the case of spreading rubber composition, this method involves a preparation in solvents of the pure or compounded gum to a fairly thick consistency

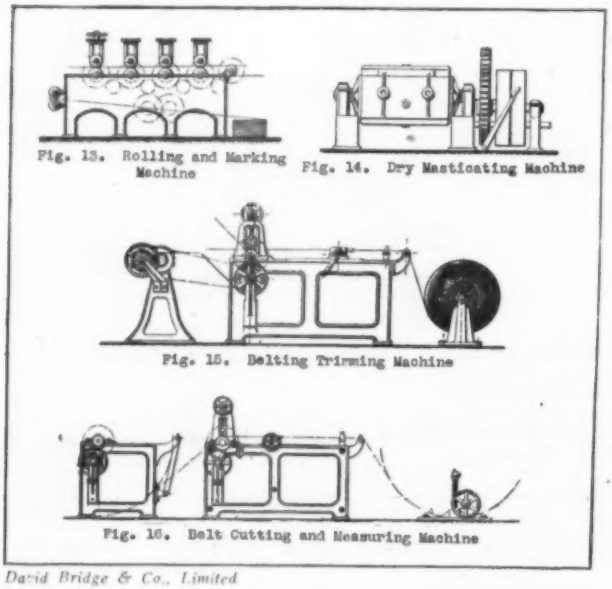

Fig. 13. Rolling and Marking Machine

Fig. 14. Dry Masticating Machine

Fig. 15. Belting Trimming Machine

Fig. 16. Belt Cutting and Measuring Machine

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which admits of even distribution on the warm duck as the latter passes through the plastic mass between the roller and spreading knife. As in ordinary spreading of rubber stock, the solvent is eliminated from the fabric by evaporation as the goods pass over a drying table warmed by a steam heating system.

IMPREGNATING BY FRICTION CALENDER

During the Great War, owing to the scarcity of solvents, the French makers of balata belting found it feasible to use the ordinary three-roll friction calender for applying balata to warm duck, thus saving both time and solvent.

BALATA BELT-MAKING MACHINERY

By whatever method of impregnation the balata-coated duck may be prepared, it is made up into belting in specially designed machines here illustrated.

The first operation is cutting the fabric to the widths necessary to make the desired plies. This is rapidly and accurately done by a special slitting machine, Fig. 11. The fabric is next folded back upon itself and passes through the rolling machine, Fig. 12. In these machines the balata stock is kept sufficiently warm to insure the strongly adhesive condition of the balata compound necessary to bind the plies into a homogeneous body under the rolling pressure of the building machines. After having been rolled two-ply thick the duck passes over a conveyor and is again folded, heated and rolled, and so on until the desired number of plies is completed.

The warm belt is then ready for stretching between the straining heads in connection with a stretching machine. The belt is cooled while under strain so that the stiff balata may fix the warp of the fabric at the stretched length which will not further elongate under the service strains of power transmission.

After stretching and cooling, the belt is ready to receive a final covering of balata. This is applied to one side only as the belt goes through the rolling and marking machine, Fig. 13. On the opposite or driving contact side the surface is left as impregnated. The composition used as a cover is generally inferior in quality to that used in impregnating the duck and is prepared without solvent in the dry masticating machine shown in Fig. 14.

The belt is finally finished in the trimming machine, Fig. 15, which trims and finishes the edges, stamps the surface with the maker's trade mark, and delivers the goods in a finished roll ready for measurement and cutting to specified lengths as required by orders for shipment.

COMPOSITION AND TESTS[1]

TYPICAL COMPOUNDS

No. 1. EXTERIOR COATING:
Specific gravity, 0.989.
Ash, 2.53 (iron and magnesia).
Adhesive coating:
Ash, 1.29 per cent.
Weight of duck, 852 grams per square meter.
Weight of gum, 425 grams per square meter.
Weight of exterior coating, 500 grams per square meter.
Adhesive temperature of the gum, 50 degrees C.

No. 2. EXTERIOR COATING:
Specific gravity, 1.056.
Ash, 12.09 (iron and magnesia).
Adhesive coating:
Ash, 1.38 per cent.
Weight of duck, 745 grams per square meter.
Weight of gum, 300 grams per square meter.
Weight of exterior coating 550 grams per square meter.
Adhesive temperature of the gum, 54 degrees C.

ANALYSIS OF BALATA BELTING MIXTURES

Sample	Percentage Composition	Specific Gravity	Breaking Strength Kilos Per Square Mm.	Stretch Per Cent	Softening Point Degrees C.
	Washed balata	floating	0.650	180	43.5
	Deresinated balata	.....	2.200	380	58.
1	Washed balata 50.....	.....	0.400	...	41.
	Organic fillers 50.				
8	Washed balata 66.....	1.186	0.630	...	45.5
	Mineral fillers A-34.				
13	Washed balata 50%.....	1.350	0.350	35	45.5
	Mineral fillers A-50.				
14	Washed balata 50.....	1.350	0.650	20	46.
	Mineral fillers B-50.				
15	Washed balata 50.....	1.570	0.650	120	41.
	Mineral fillers C-50.				
33	Washed balata 66.....	1.060	0.650	120	40.
	Mineral fillers B-34.				
114	Washed balata 50.....	floating	0.580	210	43.
	Reclaimed balata 50.				

ADHESION TESTS OF PLIES

Samples	Adhesion Temperature Degrees C.	"Friction" Test or Resistance to Separation: Between Plies One and Two Kilos.	Between Plies Two and Three Kilos.
Washed balata	56	4.986	4.686
No. 1	50	1.936	1.286
No. 2	54	2.236	2.336
No. 14	58	2.032	1.934
No. 33	47	3.259	3.114
No. 114	50	2.307	2.180

[1]From article by Gustave Bernstein in Le Caoutchouc et la Gutta Percha, March 15, 1920.

NEW STYLES AND MATERIALS IN BRITISH WATERPROOFS

From England comes a good-looking line of waterproof clothing made of rubberized cloth in various colors and materials. This company makes a specialty of ladies' high-class garments and capes of silk lined with pure rubber. Others are made of rubberized cotton and cotton-and-wool mixtures. The styles shown are nobby and becoming, and perfectly appropriate for stormy weather. Motor jackets, motor suits, cycling capes and children's capes with hoods are included in this line of rubberized clothing.—The Crown Court Waterproof & Rainproof Co., Limited, Crown Court, Ashley Lane, Manchester, England.

Artificial Lighting in the Rubber Industry

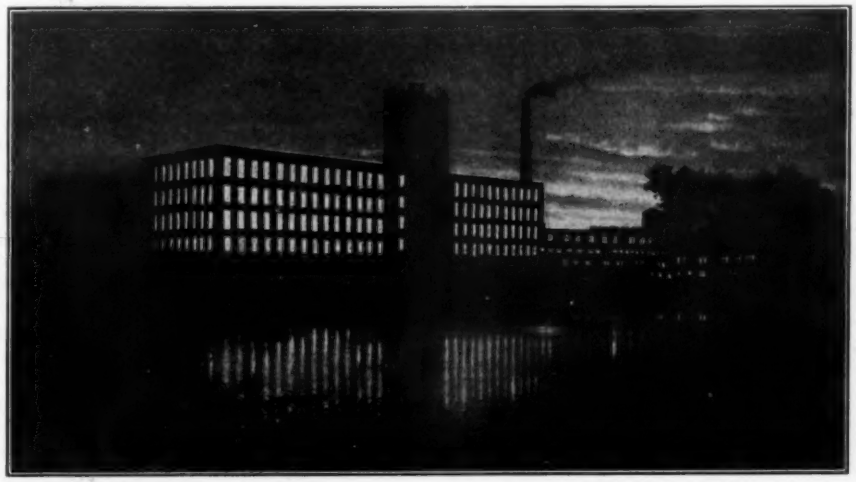
By E. Leavenworth Elliott

IN a recent issue of this publication there was an article describing in detail the equipment for a tire plant. Under the heading of "Power, Heat and Light," the subject of illumination is disposed of as follows:

"The lighting required is a good industrial lighting unit with the exception of around the calenders, where a special unit is required so that there will be a sufficient light both in front and back of the calenders. The lighting unit for the plant as outlined is one light to a bay, the bay being 20 feet square."

How extremely simple is this matter of lighting; "a single lighting unit to each bay," and it is done! Call the next case.

It must not be inferred that this is intended as a personal criticism of the writer of the article; the quotation is given as an example of the treatment which the vitally important subject of lighting too often receives at the hands of consulting engineers and architects. What is still more unfortunate, the question is also quite generally either sidestepped or bungled by production managers and the executives "higher up." There is still a prevalent notion, inherited from the days of the candle and the gas flame, that artificial lighting at the best is but a makeshift, which has to be resorted to when daylight fails, but which of necessity reduces the efficiency of those working under it. The actual fact is, that modern electric light can not only furnish a full equivalent of the best daylight, but in many cases may appreciably surpass it, by increasing the productive efficiency of labor. In a comparison of the relative merits of daylight and electric light for industrial illumination the advantage rests with the latter.



ARTIFICIAL LIGHTING BY WHICH LABOR OPERATES AS EFFICIENTLY AS BY DAYLIGHT

THE HICH COST OF BAD LIGHTING

In one large city the electrical engineer of a large tire plant, which was running three 8-hour shifts, told me that the first night shift was 60 per cent efficient, and the second only 40 per cent efficient, as compared with the day shift. He explained the greater inefficiency of the second shift by the fact that the learners were put on it. I also found in this same city a specialized plant in which the night shift was 17 per cent *more* efficient than the day shift, and a number of gigantic works in which the night production was fully equal to the daylight output.

The difference between 40 per cent discount and 17 per cent premium on factory output is certainly no small matter in manufacturing cost. To what can such wide discrepancy be due? Certainly not to mechanical equipment, nor difference in the personal skill of the workmen; it was simply a matter of good and bad lighting. The plant which was turning out 17 per cent more product on its night shift was by no means an isolated case; plenty of instances could be given in all branches of industry where the output under electric light regularly exceeds that under daylight. What can be done in one factory can be done in any other of its type.

THE REMEDY FOR WAR HYSTERIA

The feverish condition of industry, running often into hysteria, that was induced by the war, reached its climax a year ago, and the inevitable reaction has set in. Efficiency, economy and thrift are the tonics essential to this period of convalescence. The more thoroughly they are administered the quicker and more complete the final recovery of our declining industries will be.

In other words, the remedy is: Get the utmost out of the physical equipment, and out of the human machine; eliminate waste, of both energy and materials; and keep to a steady course that does not involve too many or too long chances.

Taking these up in order, we find one of the greatest transgressions at the very beginning. The most is not being gotten out of plant and equipment. What is called "full time" operation is in actual fact not one-half full time. Taking the 8-hour workday as the standard, the factory that is running the usual day shift is idle two-thirds of the time. What physical reason is there for this gross inefficiency? Nothing but the substitution of artificial for natural light. All other conditions are exactly the same throughout the twenty-four hours of the day. If the artificial light enables the workman to do his work as rapidly and as well as natural light, then there is nothing in the way of uniform production—of a "flat production curve"—so far as physical facilities are concerned.

HYGIENIC ASPECTS OF NIGHT OPERATION

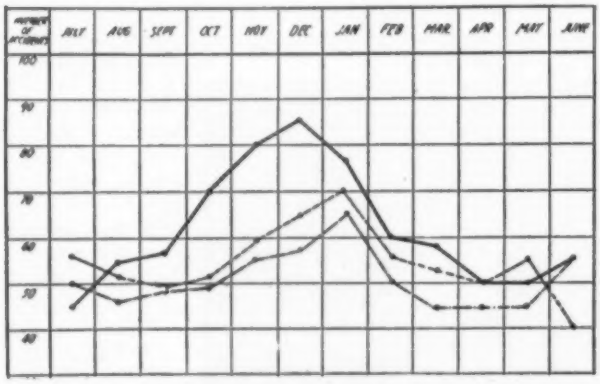
So far as statistics go, there is no evidence that the health of night workers suffers in proper night work, and there is no scientific reason why it should. The great fact is that night work means daylight leisure. Day leisure means outdoor recreation; and the value of open-air enjoyment to indoor workers is unquestioned. The general outcry against the repeal of the "daylight-saving" legislation is an impressive lesson on the appreciation of daylight leisure by the indoor worker.

What direct action has light upon the health of the workers? Such knowledge as we have on the subject points to two lines of inquiry: first, the action of light in promoting the vital processes; and second, the germicidal effect of the violet and ultra-violet rays. Without attempting to discuss these highly technical subjects, it may be said that one of the two kinds of electric light now in common use possesses the same quality as sunlight in respect to these rays; and there is reason to believe that this

light is at least as effective in promoting life and destroying harmful germs as indirect sunlight, or direct sunlight that has passed through glass. From the hygienic standpoint, then, there is nothing against night work in a properly lighted room.

THE PSYCHOLOGICAL ASPECTS

And what of the psychological aspects of the subject? A few years ago such a question would have been ruled out as "high-brow stuff" by the "practical" works manager. But not so now; the very obvious fact that the human machine is operated by the brain, and therefore the condition of this controlling apparatus is a matter of prime importance, has filtered into the minds of the whilom scoffers. Electricians tell us that the amount of electricity that you can obtain from a given connection is directly proportional to the electromotive force at the source, and inversely proportional to the resistance of the conductor. This may serve as an analogy by which to describe the effect of the mind upon the worker. The "electromotive force" is the necessity for him to make his living—the fear of "losing his job"; the "resistance" is his natural laziness, the irksomeness of labor as such. The output of any individual worker will depend upon these two forces.



RELATION OF INDUSTRIAL ACCIDENTS TO ILLUMINATION

A MAXIMUM OF ACCIDENTS OCCUR DURING NOVEMBER, DECEMBER AND JANUARY, THE MONTHS OF MINIMUM DAYLIGHT

The effect of a greatly reduced "labor-motive force" resulting from the shortage of workmen is still a very vivid memory in the minds of employers. How to reduce the resistance, the innate repugnance to work, is the most serious problem confronting the efficiency engineer and the scientific manager today. To supply incentive, to create interest, to inspire enthusiasm, to relieve tedium, in short, to increase the will to work, are subjects which fall within the domain of modern psychology. Aside from the ancient prejudice of the worker against night labor, the fact is that night offers better conditions for work; there are fewer distractions, and less heat in summer.

That there are sociological problems involved is evidenced by the fact that at least one of the great manufacturing states has a law against night work by women, and strenuous efforts have been made to introduce such laws into New York State.

THE ECONOMIC ASPECTS

Little argument is needed to show the economic advantages which night work presents. The difference between profit and loss in manufacturing may often be solely a question of the overhead expense. Interest, taxes, insurance, and depreciation of plant make up the larger part of the fixed charges. Double shift means cutting this in half, and triple shift, or continuous operation, cutting in thirds, prorated to output. To build and equip new factories to be idle half or two-thirds of the time is an unpardonable sin against efficiency and economy. Adequate and proper electric lighting is capable of doubling the value of the total investment in manufacturing plants throughout the world, measured by their producing capacity.

But the economic importance of artificial lighting is not confined to the strictly night-shift operation. Daylight is insufficient for maximum production for a considerable portion of the time of the 8-hour day shift, totaled for the year. There are dark days in the winter, dark mornings and afternoons in spring and fall, and many rooms that are naturally dark at any time. In one of the most up-to-date automobile plants I recently saw hundreds of electric lamps burning on a bright autumn day. To have the production kept up in both quantity and quality regardless of the vagaries of the weather, or changes of season, is a manifest wisdom to a manufacturer who would thrive,—to keep at the top in those trying periods when the weaker go to the wall. Any loss in production due to inadequate lighting is an absolutely needless waste.

COST OF ARTIFICIAL LIGHTING

The cost of artificial lighting is a matter that can be disposed of with very little discussion. Light is the one facility that most directly affects the output of the human machine. Its results vary from zero, or nothing, in total darkness, to 100 per cent in proper illumination. A light that reduces the output 10 per cent is equivalent to a 10 per cent raise in wages. The only logical method of figuring the cost of light is therefore to equate it with wages. In one tire plant, which may serve as an example, the cost of electric light was two cents for an average size tire. A curious case is that of a very large automobile plant, in which the cost of washing the windows is equal to the cost of all the electric light used, and the plant regularly runs continuously. A little arithmetic will show how the matter stands. Suppose a workman is receiving a wage of 60 cents an hour, which is one cent a minute. Suppose the cost of electric current is one cent per unit (k.w.h.). One minute of wages is then equal to one unit of current, or 1,000 watts, for one hour, or 100 watts for 10 hours. One minute of wages, therefore, will pay for the current for a 100-watt lamp for a ten-hour day. Current, however, is not the whole cost of the light; there are the other items of lamps, accessories, and upkeep. All of these should not exceed the cost of the current. One minute of wages may then be considered equal to the entire cost of light from a 50-watt lamp for a 10-hour day, or a 60-watt lamp for 8 hours. This would be ample for work in a fixed position; but if general illumination were required where the work or machines were more or less widely separated, two, or even three times this amount might be required.

We may, therefore, say that the loss of from one to three minutes of a workman's time will balance the cost of a 100 per cent light for his whole working day. Economy is good management, the most profitable proportioning of outgo to income. Can there be any worse economy than a failure to supply the best possible light for the workman?

LESSENS SHOP ACCIDENTS

There is one collateral branch of the subject of the economics of lighting which is of importance, and that is its relation to industrial accidents. Some ten years ago a fairly comprehensive compilation of statistics showed that 25 per cent of industrial accidents were due to faulty lighting. Recent statistics indicate that but 15 per cent are now traceable to this source. This is a gratifying improvement, but it is still exactly 15 per cent too many. With the present cheapness and ease with which ample light for safety can be supplied, there is no excuse for failure in this regard. Avoidable accidents to the human machine are not good economy.

THE SUMMARY

Artificial light can now be produced by which all kinds of labor can be performed as efficiently as by daylight, and in some cases more efficiently.

Since light is the only difference between the day and night conditions for work in the factory, there is no necessity for the plant being idle at night.

The continuous operation of plant is the greatest source of economy in production that can be made, short of a large investment in more efficient machinery if such is obtainable.

Sunlight is insufficient for the full day shift, and artificial light is therefore a necessity. It should enable the worker to produce as much as by the best daylight.

Compared with the cost of labor, the cost of light is a negligible quantity.

There is no excuse for industrial accidents from inadequate lighting.

Light is the most vitally important of all the facilities necessary for the performance of labor. It should be given correspondingly careful consideration.

In the next article the fundamental principles pertaining to the use of light will be discussed.

Cost Accounting in the Rubber Industry—II[1]

By Ferd G. Kirby[2]

PRIVATE LEDGER ACCOUNTS

FIGURES 2, 3 and 4 are charts of private ledger accounts, covering the accounts of a rubber heel factory. The accounting for this plant will be used as an example to demonstrate the methods suggested. It will be noted that the order of the accounts in the ledger is the same as that in which they appear on the statements shown later. Assets are arranged in order of their availability and are followed by liabilities in order of priority. These, in turn, are followed by the various revenue and expense accounts in logical order. This arrangement greatly simplifies the preparation of all statements, reducing it to a simple matter of copying off the amounts from the ledger.

PRIVATE LEDGER ACCOUNTS
ASSETS

	A Quick Cash and Rec.	B Quick Inventories	C Fixed	D Nominal
1	Cash in Office		Land	Insurance Unexpired
2	Cash in Bank		Old Buildings	Rubber Association of America—Dues
3	Accounts Receivable Customers		New Buildings	
4	Reserve for Trade Discount		Machinery and Equipment	
5	Notes Receivable		Tools	
6	Notes Receivable Discounted		Stable and Garage Equipment	
7	Accounts Receivable Personal		Office Furniture and Fixtures	
8				
9				
10	Trade Acceptances Receivable			Interest Prepaid
11	Liberty Bonds			Branch Rent Prepaid
12	War Saving Stamps			
13		Factory Ledger Controlling Account		
14		Finished Merchandise		
15		Samples	Reserve for Depreciation	
16				
17				
18				

FIG. 2

PRIVATE LEDGER ACCOUNTS
LIABILITIES

	E Current	F Reserves	G Indirect	H
1	Accounts Payable Wages		Capital Stock	
2	Accounts Payable Trade		Surplus	
3	Notes Payable			
4			Gross Profit	
5		Reserve for Employers Liability	Manufacturing Profit	
6	Accrued Taxes		Net Profit	
7			Dividends Paid	
8			Federal Taxes Paid	
9				
10	Trade Acceptances Payable			
11	Accrued Interest			
12				
13				
14				
15				
16				
17				
18				

FIG. 3

PRIVATE LEDGER ACCOUNTS
REVENUE AND EXPENSE

	J Sales	K Deductions	L Cost of Shipments	M Administrative Expense	N Selling Expense	O Other
1	Merchandise Sales	Freight Allowed	Factory Cost of Shipments	Executive Salaries	Selling Salaries and Commissions	Interest Received
2			Commercial Cost of Shipments	Office Salaries	Traveling Expense	Discounts Received
3		Trade Discount Allowed		Subscriptions Telephone Postage	Catalogues	Rents
4		Other Deductions		Taxes Stamps	Advertising	Scrap Sales
5		Returns and Allowances		Stationery Printing Office Supplies	Credits and Collections	
6				General Office Expense	Bad Debts	Resales
7				Other Administrative Expense	Branch Rent	
8				Patriotic Fund	Freight on Returns	Interest Paid
9						Discounts Allowed
10						Depreciation Real Estate Expense
11						Scrap Delivery Expense
12						
13						
14						
15						
16						
17						
18					Reserve for Commercial Accounts	

FIG. 4

Any of the accounts as shown may be subdivided and the subdivision indicated by placing an additional letter after the account symbol, thus A3, accounts receivable customers, may be subdivided:

A3a—Accounts receivable, city.
A3b—Accounts receivable, foreign, etc.

The account symbol is placed upon the outer upper corner of the ledger sheet, and the sheets arranged alphabetically in the ledger by sections. In each subdivision thus established the accounts are arranged numerically.

INVENTORY ACCOUNTS

The inventory accounts as detailed in the foregoing are charged with the result of physical inventories when taken. For each succeeding month they are charged with all material purchased and credited with the quantities of materials consumed, which will be determined by the reports provided through the material requisitions. The balances appearing in these accounts at the end of each month represent the inventory value of raw materials on hand, the amount of material, labor and burden in process and amount of material, labor and burden on hand of finished product, and the amount of burden unabsorbed and overapplied.

VOUCHER AND CHECK REGISTER

As indicated in the foregoing, in this particular application of costs shown, no ledger was kept for accounts payable. The voucher register serves both as a purchase ledger and check register and, as invoices are paid, the proper purchase accounts are debited. At the end of the month all unpaid invoices, the goods for which have been received, are entered at the foot of the voucher register, and their amounts distributed in the various debit columns. The total amount of these unpaid invoices, in stead of being entered in the "Amount of Check" column, is carried to the "Accounts Payable Cr." column, from whence it is posted to the private ledger. The next month, when these vouchers are paid the checks are entered in the "Accounts Payable Dr." column instead of being charged to the purchase accounts. In this manner the ledger will show the amount of unpaid bills at the first of each month, and at the same time the necessity of a purchase ledger and a separate disbursement record is avoided.

This arrangement was possible in this particular case because it was desired to distribute the charges to the various inventory accounts only when the bills were actually paid, instead of when the invoices were received.

[1] Continued from THE INDIA RUBBER WORLD, December 1, 1920, pages 155-157.

[2] Accountant, R. T. Lyman & Co., Inc.

Usually, however, a purchase journal is used, as this allows the proper distributions to be made to the works ledger accounts more promptly and also provides a daily balance of unpaid bills if necessary. When a purchase journal is used a cash book replaces the voucher and cash received registers.

DEPRECIATION

Depreciation is written off monthly by charging the works ledger controlling account and crediting reserve for depreciation. The credit balance in the reserve for depreciation account will be carried from year to year as a deduction from fixed assets. When any machinery is sold or scrapped this account should be credited with the amount written off to date upon the article disposed of.

MONTHLY STATEMENTS

The following statements should be made up each month: financial statement; factory ledger balance sheet; loss and gain statement; analysis of commercial expense; analysis of factory expense; graphic records.

These statements are made in comparative monthly form, showing the results of operations month by month, an extra column being provided for yearly totals and final results after closing the books. The accounts appear on the ledger in exactly the same order in which the items appear on the statements, and the mechanical work of taking off the statement is very simple.

Following are a few brief suggestions on the use of these statements after they are submitted to the executives:

FINANCIAL STATEMENT

This statement lists the assets in order of their availability and liabilities in order of their priority with sub-totals showing the totals of current liabilities and current assets.

A comparison of the current liabilities with the current assets available to meet them gives a very valuable insight into the financial condition of the business, and if carefully watched from month to month, will be of great assistance in arranging to take advantage of cash discounts and in avoiding the payment of excessive interest charges.

An examination of this statement will indicate exactly where the working capital is invested and will serve as a check upon investing too much capital in raw material and inventories.

FACTORY LEDGER BALANCE SHEET

This statement shows the details of the inventories which are summarized on the financial statement. It should be carefully watched with the following ideas in mind:

(a) The amounts of the various inventories should be kept as low as practical in order to prevent overbuying and tying up working capital unnecessarily.

(b) The amounts should be carefully compared with the actual amount of materials in the plant as any variation between the physical and book inventories must result from an error in the cost figures which should be investigated and corrected.

The work-in-process accounts particularly should be watched and a comparison made between the proportion of material, labor and burden in process, from month to month. Charges to these accounts may be relied upon as correct if material requisitions are properly handled. Any variation must, therefore, come from an error in crediting these accounts with the cost of shipments, and must therefore reflect an error in the cost of figures. If the book inventory exceeds the physical inventory, it is evident that the credits have been too small. That is, the cost of shipments have been figured too low and the profit as shown by the books is too high. If the physical inventory is greater than that shown by the books, cost of shipments have been figured too high and the actual profits are in excess of those shown on the books and statements.

The division of these work-in-process accounts into material, labor and burden facilitates the location of errors. Unabsorbed or overapplied burden should show only a small balance. The continued accumulation of any large amount under any one of these headings indicates a necessity of changing the burden rate.

PROFIT AND LOSS STATEMENT

This statement is self-explanatory and affords a monthly comparison of sales, cost of sales, operative profit and miscellaneous items of income and expenditure. The proportion of profits to sales gives a check upon the relative sales in profitable lines. The amount of job discount allowed should also be watched and kept as low as practical.

EXPENSE STATEMENTS

The monthly expense as shown by these statements should be carefully compared, both in detail and total, with that shown for previous months. Any material variations should be noted and investigated. The amounts shown on these statements represent an outlay for intangible items and any reduction or saving which may be effected is clear profit.

GRAPHIC REPORTS

A series of graphic reports should also be put in operation, showing in graphic form the productive and non-productive labor and bonus for each department. These reports should be watched from month to month, noting the relation of productive and non-productive labor, and the relation between the monthly productive labor and bonus earned. From an inspection of these reports a very good idea of the relative efficiency of the various departments may be obtained.

UTILITY OF COSTS

The preparation of these costs requires but one cost clerk in addition to the personnel of the planning department. This is made possible through the unification of production and cost records. In other words, the function of the control exerted by the planning department not only endeavors to control effectively the operation of the plant, but obtains its necessary production records in such a manner that a basis for costs is furnished without the expense of accumulating additional special records.

Occasionally, where the operation of the plan is somewhat difficult to check and control, it is necessary to obtain the costs not by orders, but to obtain the labor cost by operations. The job time cards are sorted by parts and operation and for each part of a unit of product a direct labor cost accumulation card is used. The total number of parts handled on each operation is divided into the total cost of performing this operation, as shown on the job time cards and posted against the proper operation as listed on the form. This is very valuable as a basis for comparing the cost of operations monthly, and reflects the efficiency of operation of the factory as a whole better than when these operational efficiencies are split up and recorded by others. Finally, at the end of each month, the total unit cost by operations is listed on the front of the total cost per unit form, the operations being listed in the proper column and the necessary burden and miscellaneous department items of labor accumulated into the total. On the reverse of the form the total cost of material is obtained. It should be noted that provision should be made for covering the fluctuation of rubber cost on this form, either because of changes in price or variations in waste percentage.

In either case, that is, whether costs are collected by orders or by operations, the cost figures should be analyzed to reflect not only true cost for the determination of selling prices as well as monthly financial statements, but to reflect operating efficiency. Any increase in material cost on an item should be analyzed to determine whether it is due to market fluctuation or to inefficient utilization of material. All labor cost increases should also be traced down to the operation and, when possible to the operative responsible, and steps taken to prevent a recurrence. In general, costs should be a lever to control the effectuality of a business rather than a history of past performances and positive constructive action should be taken that will stimulate production and make it cost less.

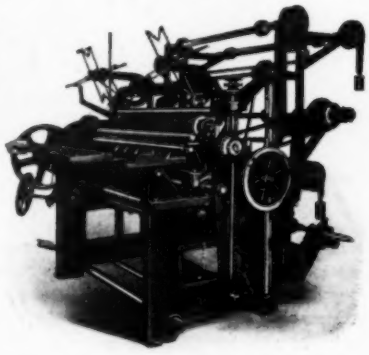
The Manufacture of Tire Flaps

TIRE flaps were originated to meet the necessity of protecting the inner tube of a pneumatic tire against injury in service, from chafing on rim, tread or beads and from pinching caused by flexing of the tire walls.

Reliners are similar to tire flaps in construction, but generally are wider and thicker. They are formed to fit between the casing and inner tube against the tread side instead of the rim side.

CONSTRUCTION

Tire flaps and reliners are of laminated construction consisting of rubberized plies of fabric built up in stepped widths. Thus the flap is thick at the center and thin at the edges, which permits it to be readily molded with crescent-shaped cross-section.



CAMERON SLITTING AND REWINDING MACHINE.

Referring especially to tire flaps, the concave side practically affords a continuation of the inner wall of the tire casing and accommodates the shape of the inflated tube, while its opposite convex surface is molded to seat comfortably on the tread surface of the rim between the tire beads. The edges of the flap or reliner are sufficiently thin and pliable to prevent injury to the tube by chafing.

MATERIAL FOR FLAPS

The material commonly used in the construction of tire flaps is light-weight flat duck, osnaburg, sheeting or combinations of these. Sometimes cotton flannel is employed as a facing on the inner-tube side. The number of plies is usually four or five. The inner plies are, of course, friction-coated on both sides, while those forming the outer surfaces are frictioned on one side only. The edges of the flaps are ordinarily two-ply by the union of the fabric layers of the outer surfaces. In such case the flap has a plain cut edge. Better grades are finished on the edges by folding about one-quarter of an inch of the ply from the inner tube side onto the opposite side.

HAND-MADE FLAPS

Flap production has probably advanced more rapidly during the past two or three years than any other feature in tire manufacturing. Previously it was thought necessary to build flaps singly on a concave drum, laying up the plies in rotation by hand. This construction was known as the "endless type." The method was gradually improved by home-made devices, making use of wringer rollers to pull the several plies from spindles. The wringer rollers also pressed the plies together, uniting them by the adhesive quality of the friction. The hand-built flap was generally cured in a press of the general design of ordinary platen presses, except that the face plates were so shaped as to give the cross-sectional curve to the flap. The defects of this method of curing were high cost per flap, due to slowness of production, and failure to impart to the flap the transsectional curve needed to perfect the proper shape of the finished goods.

MACHINE-MADE FLAPS

Machine processes have generally superseded hand methods in flap production, permitting them to be run off in continuous lengths at high speed. Various machines are employed for the purpose, namely: slitting and rewinding, flap building, flap measuring and cutting, and drum filling machines.

Rolls of adhesive friction-coated fabric in liners as received from the friction calender, with interliner of plain separating sheeting, are delivered to a slitting and rewinding machine. This is provided with adjustable circular knives by which the fabric is cut to precise widths, thence passing on through the rewinding device which separates and accurately winds the strips into individual rolls ready for making up in the flap-building machine.

FLAP-BUILDING MACHINE

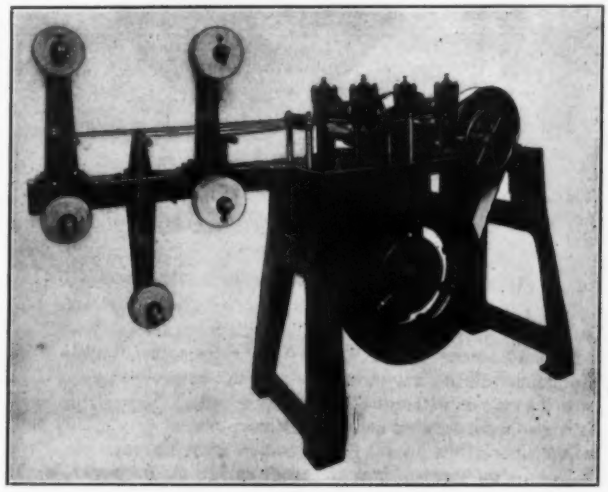
In general design the flap-building machine is similar to a belt-folding machine. It consists of two small calenders, the first of which strips the fabric from the rolls mounted on spindles at the rear of the machine as shown in the illustration.

The rolls of ply stock are arranged on the spindles so that the different widths are delivered for lamination in proper sequence and are faced on both sides by single-coated plies.

PROCESS OF BUILDING FLAPS

As the plies leave the spindles they run through a set of guides, each ply of the flap passing through a separate guide in order that all may register accurately as they unite in the laminated strip. From the guides the flap enters the first set of pressing rollers. This set of rollers also pulls the various plies from the stock rolls. Between the first set and second set of rollers is placed a folding device that turns over the edges of the flap. The advantage of a folded-edge flap is that the rough edges of the narrower plies are covered and thus do not come in contact with the inner tube. It also improves the appearance of the flap.

From the folding device the flap enters the second set of pressing rollers which rolls down the fold. The top roller is rubber-



DEXTER FLAP BUILDING MACHINE.

covered to accommodate the various thicknesses due to the plies varying in width and equalize the pressure across the flap.

From the second set of rollers the flap is drawn over a breaker drum, and wound on the detachable curing drum underneath the machine. The curing drum is friction-driven, so that its speed is much faster than that of the machine. This allows the flap to be pulled into the drums very tightly and conform closely to the curvature of the drum. Each drum as it fills up with stock is

taken from the machine and wrapped with strips of wet cloth to protect the top flap from the steam while curing.

The advantages of curing flaps in drums are numerous. First the flap is given both curves in one operation, thus insuring that the flap will exactly fit the rim and tire. Second, on the average curing drums approximately 50 flaps can be cured at one time. The average drum is about three inches in width, which permits many drums to be placed in a vulcanizer in the same heat.

The flap-making machine is driven by a direct-connected one-horse-power motor or from an overhead shaft and is speeded to produce 6,000 feet of flap per hour, either four or five ply.

CURING DRUMS

The curing drums upon which the flap as produced by the building machine is received are built of steel. They are so constructed, as shown in the illustration, that they give the proper curves to the flap, thus insuring its fitting the tube as well as the tire.

The drums are about 30 inches in diameter, divided into sections through the center and held together with thumb screws.

DEXTER FLAP CURING DRUMS

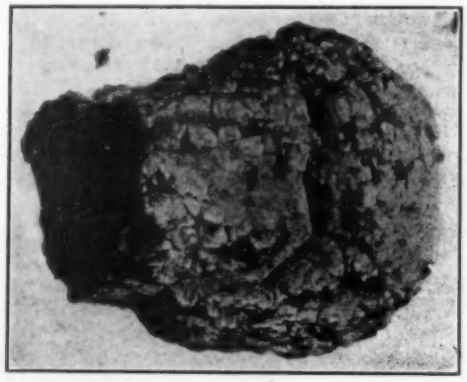
This feature provides for greater ease in handling the strips of flap stock after curing, without unreeling.

THE OLDEST PIECE OF RUBBER IN THE WORLD

The extensive use of rubber is so decidedly a development of later years that we are prone to consider it a substance of comparatively recent discovery. History refutes this, however, as Columbus, during his second visit to the new world in 1493-96, saw the natives of Haiti playing a game with balls of "gum," and it is also recorded that natives of Mexico played with rubber balls at the time of the advent of emigration from Europe.

The oldest piece of manufactured rubber in the world, in the belief of Francis E. Lloyd, professor of botany at McGill University, Montreal, Quebec, Canada, was discovered in December, 1909, in some excavations for a dam near Sasco, Arizona. While digging in an off-wash from an adjacent mountain, an earthenware jar was uncovered three feet below the surface, in which lay a ball of rubber together with some stone implements recognized by archeologists as belonging to the older prehistoric ruins of the country. The ball is shrunken, with cracked, hard surfaces incrusted with a sort of light buff-colored plaster. The cut surfaces are black and show a definite banding. The interior looks and feels like a quite good sample of ordinary crude rubber. Surrounding this is a dark shiny band, tacky and apparently resinous. Bubbles of air can be seen scattered in the mass of still preserved rubber.

The origin of this ancient plaything is a matter of conjecture. As it was found in a region similar to that in which guayule



The Dominion

A PREHISTORIC RUBBER BALL

rubber is produced, it may be that substance. It may even have come by devious ways from far away South America. But whatever its origin, the rubber has stood the tests of time almost as immutably as stone.

SOME MICROSECTIONS CUT FROM VULCANIZED RUBBER ARTICLES[1]

By Harlan A. Depew and I. R. Ruby[2]

IT has long been recognized that pigments for use in rubber work should consist of very fine particles.

Microscopic work done in this laboratory on pigments in linseed oil and other paint vehicles has shown that fine particles tend to exist as flocculates. In certain vehicles this flocculation is largely or entirely overcome. In the case of water suspensions, as well as of paints, the physical properties of a deflocculated and a flocculated suspension differ greatly.

Carrying the suspension analogy still further to the very much more viscous (properly, plastic) medium, rubber, it seems reasonable to assume that dispersion and flocculation of pigments play important parts in determining the physical properties of compounded rubber.

Attempts to determine the dispersion of pigments in compounded rubber by reflected light have failed, because with the high magnifying powers necessary to see the individual particles of, for example, zinc oxide or carbon black, the illumination of the surface is entirely too weak, particularly where the reflecting properties of the medium and the suspended pigment are close. Our success with transmitted light in water and oil suspensions pointed to this method of illumination for the examination of compounded rubber.

There is considerable difficulty in cutting sufficiently thin sections of vulcanized rubber, owing to its elasticity and toughness, especially in the case of rubber highly compounded with zinc oxide or carbon black, where the thickness must not exceed one μ.[3] In less highly compounded matter the section can be 20 μ thick, or even thicker. The elasticity can be destroyed by immersing in liquid air, but this makes the sample too hard to cut. Accordingly, the rubber must be frozen to an extent just sufficient to destroy its elasticity and yet not make it too hard.

[1]Read before the Rubber Division of the American Chemical Society, Chicago, Illinois, September 6-10, 1920.

[2]Research Laboratory of the New Jersey Zinc Co., Palmerton, Pennsylvania.

[3]One μ equals 1/1000-millimeter.

PREPARING SECTIONS

The method finally developed consists in freezing the rubber by expansion of carbon dioxide on the stage of an ordinary Spencer microtome. The sample is held tight on the stage by means of a water-glycerol solution (90 : 10) which, on cooling, solidifies to a white mass. This solution is used because it does not become very brittle at the low temperatures. The carbon dioxide does not cool the sample to a sufficiently low temperature, and a surface flash cooling is given by liquid air. The liquid air can be obtained at a convenient liquid air manufacturing plant and transported without difficulty in an "Icy-Hot" bottle, which will keep liquid air for several days. The liquid air may be ejected very satisfactorily from the bottle by introducing carefully a one-hole rubber stopper through which a glass tube about 3 to 4 mm. in diameter is passed into the bottle. The pressure developed by the continual evaporation will force a stream of the liquid out, which can be directed on the sample. A very small amount will freeze the sample sufficiently.

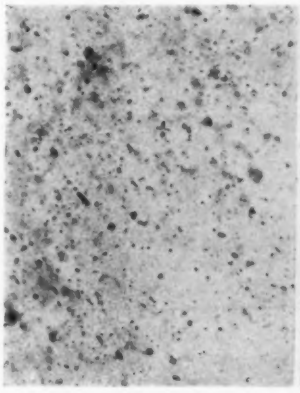


FIG. 1

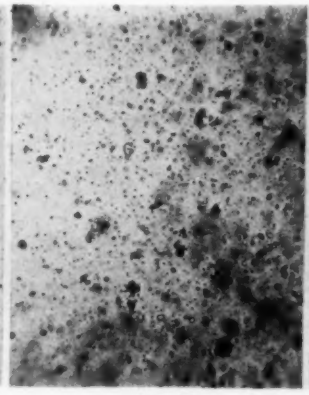


FIG. 2

FIG. 3

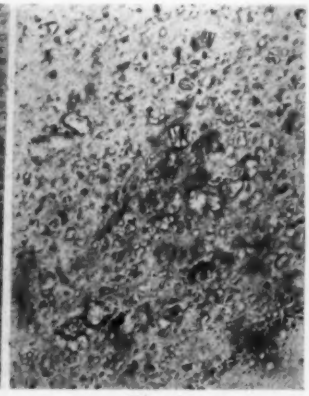


FIG. 4

The section is then cut with the knife. Raising the stage is best controlled by hand. The thin section is mounted in Canada balsam on a microscope slide and preferably examined visually at 1,500 diameters, using a Zeiss 2-mm. apochromatic oil-immersion lens. For photographing, sharper negatives are obtained at 800 diameters.

DESCRIPTION OF ILLUSTRATIONS

In Fig. 1 zinc oxide is shown uniformly dispersed in rubber. A typical triplet crystal can be noted and also the grain in the rubber in the direction of working is shown by the definite alinement of the needle-shaped crystals.

In Fig. 2 a good lithopone is shown very well dispersed.

Fig. 3 contains aluminium flake. The grain is shown very decidedly, and it is not difficult to believe that the tensile strength and elongation will vary according to the direction of testing.

Fig. 4 shows whiting.

Fig. 5 is iron oxide. It is well dispersed but contains many large particles.

Fig. 6 was litharge when introduced and should have shown clear centered particles when in focus, but the particles have become black, due to a surface coating of sulphide.

Fig. 7 is a well-known white tread with magnesia as an accelerator. Chunks of magnesia stand out in sharp contrast to the uniform distribution of the zinc oxide. The individual particles of zinc oxide do not show up well except near the edge, owing to the thickness of the section which was necessary to show the large particles of magnesia.

Fig. 8 is a section from a widely advertised composition sole bought from a shoe repairman. It shows iron oxide used in coloring, zinc oxide used in reinforcing, and fiber used for stiffening. The photograph is poor, but the section can be seen more distinctly by direct observation with the microscope.

Fig. 9 shows a zinc oxide tread with a very small amount of lampblack to give a gray color. The lampblack is badly flocculated.

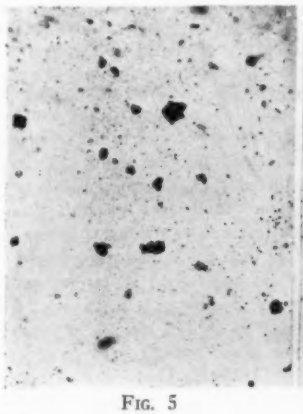


FIG. 5

FIG. 6

FIG. 7

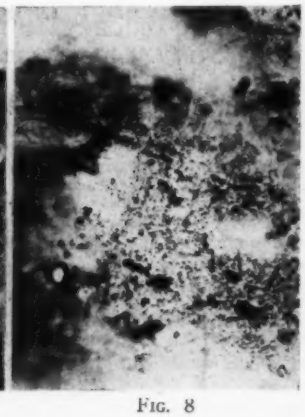


FIG. 8

Fig. 10 shows a poorly dispersed carbon black.

Fig. 11 shows a well-dispersed carbon black together with zinc oxide.

Fig. 12 a section from the sidewall containing zinc oxide and whiting.

Fig. 13 a section of a cushion from a tire showing reclaimed rubber and a small amount of zinc oxide.

CONCLUSIONS

Microscopic examination affords the following possibilities:

(1) A knowledge of the dispersion of the pigment in rubber

which will tell a good deal about the quality of the product. Flocculated pigment readily accounts for many difficulties otherwise inexplicable. Among these is the heating up of tire treads heavily compounded with carbon black.

(2) A help in the analysis of rubber goods by showing the compounding ingredients used, such as reclaimed rubber, fiber, and pigment. In the case of the pigment, it may even be possible to learn its source, because the same pigment made according to different processes varies greatly in shape and size. Chemical analysis shows no difference between blanc fixe and ground barytes, but the microscope tells at once.

Most work of this character is done by direct observation under the microscope without the trouble of photographing. By examining the slide with colored light, increased contrast is shown in certain cases. It is planned to make observations with polarized light, which should open a wide field for further investigation and for identification of the pigments. It should be mentioned also that staining of the section will bring out particles which would otherwise be invisible, as, for instance, glue.[4]

[4]W. E. Wiegand, Canadian Chemical Journal, 4 (1920), 160.

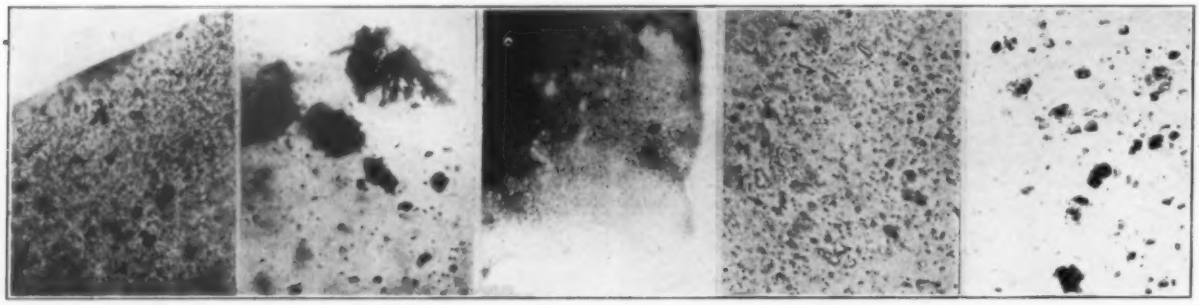


FIG. 9 FIG. 10 FIG. 11 FIG. 12 FIG. 13

THE AGING OF CERTAIN RUBBER COMPOUNDS[1]

By I. R. Ruby and Harlan A. Depew[2]

THERE has been much discussion relative to the merits of carbon black and zinc oxide treads for automobile tires. The outstanding objection to the black tread tire is that, although in the beginning it wears comparatively well, it later chips away at an accelerated rate.

Three compounds, A, B and C, were prepared and investigated for the study of this problem. Table I gives their composition by weight and by volume. These compounds are typical fast-curing tread compounds, with the exception of A, which contains a low percentage of pigment. Treads in which XX red zinc oxide is the only pigment generally carry 55 to 58 per cent of zinc oxide instead of only 46 per cent, as in this case. There is no appreciable difference in aging, however, between compounds containing 46 and 58 per cent zinc oxide, as shown by evidence not included in this report.

TABLE I—COMPOSITION OF COMPOUNDS

	By Weight			By Volume		
	A	B	C	A	B	C
First latex rubber	92	92	92	100	100	100
Sulphur	5.5	5.5	5.5	2.67	2.67	2.67
Hexamethylene tetramine	1.5	1.4	1.4	1.38	1.25	1.25
XX red zinc oxide	84	98	22	15.0	17.5	4.0
Carbon black	..	..	25	..	..	14.5
Lithopone	..	20	..	..	5.0	..

[1]Read before the Rubber Division of the American Chemical Society, Chicago, Illinois, September 6-10, 1920.

[2]Research Laboratory of the New Jersey Zinc Co., Inc., Palmerton, Pennsylvania.

The compounds were aged in an air bath at 70 degrees C. Tires, however, heat from internal friction while running, and this temperature is often exceeded. In solid tires, in fact, the temperature at times exceeds 100 degrees C.

The physical properties of the compounds after aging are tabulated in Table II.

TABLE II—PHYSICAL PROPERTIES OF THE COMPOUNDS ON AGING AT 70° C.

Time of Cure 40 Lbs. Steam Min.	0 Days		2 Days		6 Days		10 Days		16 Days	
	Tensile Strength, Lbs. per Sq. In.	Elongation, Per Cent.	Tensile Strength, Lbs. per Sq. In.	Elongation, Per Cent.	Tensile Strength, Lbs. per Sq. In.	Elongation, Per Cent.	Tensile Strength, Lbs. per Sq. In.	Elongation, Per Cent.	Tensile Strength, Lbs. per Sq. In.	Elongation, Per Cent.
Sample A										
45	3410	626	3702	639	2832	591	2761	576	2831	577
60	3594	645	3605	563	2849	544	1322	330	2403	512
90	2764	495	2650	485	785	190	786	185	855	202
120	3154	564	1251	266	915	184	992	147	766	160
Sample B										
45	3144	629	3050	589	2435	544	2403	526	1445	429
60	3203	605	2708	538	1746	429	1525	394	588	170
90	2212	485	1396	359	844	197	740	169	504	100
120	1321	339	734	189	653	132	591	99	519	87
Sample C										
45	3306	585	3243	540	1763	386	1342	308	588	182
60	3408	577	3233	525	1087	263	1470	314	502	140
90	3808	652	1645	298	773	141	684	115	496	71
120	3217	566	1008	191	607	106	543	79	550	124

It appears that the compound containing lithopone ages somewhat less satisfactorily than a straight XX red zinc oxide compound. The carbon black compound is much inferior to the others on the basis of tensile strength and elongation on aging. This is especially serious when it is realized that, as the percentage of carbon black in a tread compound increases, the heat developed by internal friction increases faster than a linear function.

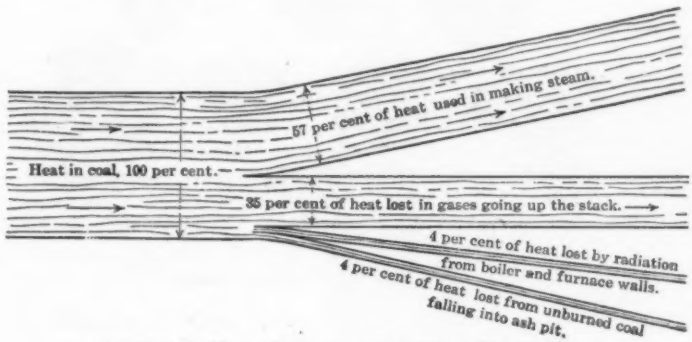
The test specimens were about 0.17-inch thick, and accordingly the tensile strength and elongation did not record an interesting hardening on the surface as fully as thinner specimens would have done. This hardening penetrated about 0.03 inch in 16 days. The rubber compounded with carbon black showed deep surface cracks from this effect by bending the rubber. There was no evidence of this surface hardening in the case of compounds A and B. This particular hardening is probably responsible to a considerable degree for the accelerated wear of a black tread tire with time, the hard surface being continually cracked and torn away by road abrasion.

The cause is uncertain, but appears to be oxidation. The absorptive power of carbon for oxygen has long been recognized and it may be reasoned that carbon black acts as a catalyst and oxidizes the soft rubber to hard rubber.

RUBBER TO THE VALUE OF £16,551 WAS EXPORTED FROM BRITISH East Africa and Uganda in 1919, as against £14,026 in the preceding year.

CONTROLLING CHIMNEY LOSSES TO SAVE FUEL

THE rubber manufacturer who congratulates himself on his economical management is distinctly shocked when reminded that while he may be saving at the spigot he is wasting at the bung-hole. Yet such a blow to the pride of many a manufacturer was delivered by one of the foremost combustion engineers of America,[1] in an address on "Saving Fuel by Controlling Chimney Losses," read before the Fuel Section of the 1920 National Exposition of Chemical Industries in New York.


57 per cent of heat used in making steam.
Heat in coal, 100 per cent.
35 per cent of heat lost in gases going up the stack.
4 per cent of heat lost by radiation from boiler and furnace walls.
4 per cent of heat lost from unburned coal falling into ash pit.

WHERE THE HEAT GOES IN THE AVERAGE BOILER PLANT

Not that the average rubber manufacturer has been unaware that a considerable amount of the latent heat in coal, which latter commodity is getting perceptibly scarcer as well as dearer, is lost in ordinary furnace combustion. He has known it quite well and has tried his best, with good boiler equipment and trained firemen, to minimize such loss. But what he has not sufficiently realized is the large extent of the loss, not merely in smoke, which seldom exceeds one per cent of the loss through the stack, but in the other products of combustion, the total wastage in this way ranging often up to 40 and even 50 per cent of the fuel used. The most conservative estimate of government investigators[2] is that out of 100 tons of coal burned under factory boilers, the heat of 35 tons is entirely lost in the flue gases. On the other hand, in boiler plants equipped with the latest scientific devices for controlling heat loss, the wastage is reduced to as low as 20 per cent.

Coming as another surprise to many having to do with steam production is the noted engineer's contention that atmospheric oxygen—or fresh air—must not be fed freely to the burning coal to get the most nearly perfect combustion, and incidentally the utmost heat. Indeed, firemen are shown how excess air plainly dilutes the heat and overtaxes the temperature possibilities of the furnace. Nor do many firemen realize that in burning a ton of coal of average fineness they use up a column of air a foot square and three miles high. Often conscientious enough in handling coal, they could serve their employers better were they more economical in handling that which costs nothing at all—fresh air.

Shorn of technical terminology, the simple chemistry of efficient coal combustion in boiler plants is that the most important furnace product (apart from the heat itself) is carbonic acid gas, i.e., carbon dioxide or CO_2; and the greater the quantity of this gas that is produced in proportion to the amount of fuel consumed, the more certain it is that the coal user is getting the maximum of heat from his fuel. Overaeration—in other words, too much draft—means the carrying off of the carbon in the coal before it is perfectly oxidized, and hence low CO_2 percentage; while underaeration means semioxidation or imperfect combustion of carbon and the resultant production of too much carbon monoxide, CO, the familiar poison gas of ill-ventilated stoves. The ideal condition is where the production of CO_2 is 21 per cent of the flue gases and exactly equals the 21 per cent of oxygen in the air passed through the coal. Forty per cent of excess air will reduce the CO_2 content to 15 per cent, 100 per cent excess will bring it down to 10.5 per cent, and a 200 per cent excess to 7 per cent.

The remedy proposed is the installing of a plain-reading CO_2 gage on the boiler front to guide the firemen, and a CO_2 recording meter in the engineer's office to give daily charts checking up the firemen's work. It is said that with such devices to observe CO_2 production and graduate air supply, excess loss of heat can be controlled in 99 out of every 100 cases, and that such instruments afford a practically unfailing index to proper draft regulation, provided, of course, that due precaution be taken to prevent air infiltration through the brick furnace setting, that firebeds be kept within suitable thickness, etc. In 24-hour tests made recently in a small New England plant, where the firemen had probably never heard of CO_2 before but who willingly regulated their work according to the CO_2 production indicator, an immediate saving in coal of 9.9 per cent was readily demonstrated.

[1] F. F. Uehling, combustion engineer, New York City.
[2] Technical paper No. 205, United States Bureau of Mines.

COTTON FIRE HOSE IGNITED UNDER TEST

Several weeks ago, engineers of the Fire Department of Boston, Massachusetts, were testing a powerful motor fire pump, to which was attached a new length of double-jacket rubber-lined cotton hose. The pump was operated at capacity, with the hose outlet reduced to one-third the usual size and the water passing at an angle from the engine to the hose, striking a spot in the hose about eight inches from the engine coupling. Under these conditions heat, due to friction, was generated sufficient to ignite the cotton jackets and cause actual flame.

By request of Fire Commissioner John R. Murphy, an investigation of this occurrence was conducted by Professor Augustus H. Gill of the Massachusetts Institute of Technology, whose report to the Commissioner is quoted in part as follows:

A thorough examination of the samples shows that the fire took place between the two cotton casings. Further examination reveals the fact that on each side of the burnt hole the casing is very severely chafed. This chafing, coming from the vibration produced in the hose by the pumping, was in my opinion, sufficient to produce great heat and finally active combustion. It seems to me that the cotton casing of the hose is not as closely woven as it should be, as is the case with certainly one other make of fire hose. It would seem that the tension on the cords in the process of weaving was not sufficiently high.

I have not made a chemical analysis of the rubber lining to ascertain the percentage of free sulphur, for I cannot see how this would be material. The sulphur here is finely scattered throughout the rubber lining and does not occur in pockets or lumps.

In conclusion, I am of the opinion that the occurrence was due to excessive friction between the cotton casings produced by the vibration of the hose in service.

ACID FORMED IN FIRE HOSE[1]

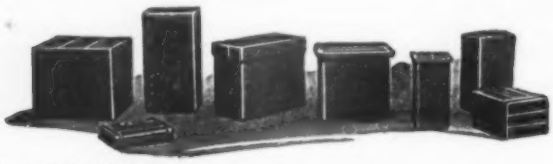
Several years ago considerable excitement was caused in various New England city fire departments because of the presence of acid found in lengths of fire hose which had been suspended on racks while partially filled with water. The technical work involved in a thorough and complete research on this matter was turned over to the chemical department of the Underwriters' Laboratories. Tests have been going on for more than a year under two distinct divisions. One was the practical aspect in which commercial full length samples of fire hose were used, and the other the laboratory investigation done on a small scale with various rubber compounds and ingredients.

[1] Laboratories' Data, Vol. 1, November, 1920, page 144, Underwriters' Laboratories, Chicago, Illinois.

Sufficient results were obtained to indicate that sulphuric acid is generated in varying amounts, and endeavor is now being made to explain scientifically how this acid is formed, where it is formed, what causes contribute to its formation, what deleterious effects it exerts upon the hose, and what remedies can be suggested to prevent its formation or nullify its action. The research program may require a year's work before the final answers can be determined.

HARD RUBBER PARTS OF STORAGE BATTERIES

IN the annals of up-to-date lighting, hard rubber seems to hold a place of considerable importance. If you descend into the depths of the sea by submarine, there are lighting elements stored away in hard rubber battery jars that make this journey possible. If perchance you ride in an airplane, hard rubber battery jars still go with you, an important factor in your safety and comfort. If you prefer to travel on land or sea,



The B. F. Goodrich Co.

BATTERY JARS

in motor boat, automobile, or train, the storage battery goes along, and if you go down into the earth you will find it there before you, in the miner's lamp. And wherever there are storage batteries of the lead-acid type, there you will find hard rubber battery jars.

Although glass and porcelain containers are sometimes used, hard rubber is a more frequent choice because it is much less fragile and also considerably lighter. A battery constructed with hard rubber containers is much simpler than one made with

The B. F. Goodrich Co.

BATTERY COVERS

lead-lined tanks, such as are sometimes used in trains, as the insulated lining between the plates and the containers is eliminated.

JARS

The main danger to be guarded against in hard rubber jars is the use of too thin walls. For the various types of batteries in common use, a prominent company which has specialized in their manufacture for many years recommends certain wall thicknesses as the minimum. For submarine boat batteries, 5/16-inch walls should be used; in batteries for electric vehicles, industrial trucks and electric launches, nine-plate and less, 3/32-inch walls, and if more than nine-plate, ⅛-inch walls are recommended. Ignition, starting and lighting batteries for motor cycles, either single or multiple compartment, take also a hard rubber container with ⅛-inch wall, and if the batteries are for automobiles and gasoline launches a wall thickness of 3/32-inch is advised, provided that compartment jars of the exposed type (not enclosed in another container) should have 5/32-inch walls, with suitable reinforcements at top and bottom. Miners' lamp batteries require ⅛-inch walls. The addition of 1/32-inch to any of the above thicknesses is advised as a good investment. Every hard rubber battery jar is subjected to an electrical test before shipment, thus guarding against the slightest defect in the marketed product.

COVERS

Battery covers are also made of hard rubber but instead of being cut from hard-rubber sheet, as was formerly the common

The B. F. Goodrich Co.

HARD AND SOFT RUBBER VENTS

method of manufacture, they are now molded. The best class of covers are vulcanized under great hydraulic pressure and in molds that do not warp or stretch. This makes them very accurate in dimensions and of great strength and superior finish. They can be made accurately to fit any type of hard rubber battery jar.

VENTS

Vents are made of hard and soft rubber, according to use. One large rubber company offers sixteen styles, accurately made

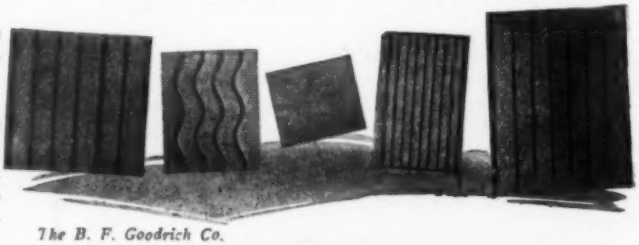
The B. F. Goodrich Co.

BATTERY SEPARATORS

with clean threads and holes, including one style of soft rubber made of an acid-resisting compound that has been proved successful against sulphuric acid. Seven styles of vents are designed for use with vent tubes in ignition, starting and lighting batteries.

SEPARATORS

In choosing battery separators, a material should be selected that is flexible enough to permit of assembling without breakage.



The B. F. Goodrich Co.

RIBBED SEPARATORS

Hard rubber has just the right toughness and is a superior material for this use. Battery separators made of hard rubber by a reliable manufacturer will retain their strong but pliable condition for a long period and will be very slow to become brittle, either in stock or in service. In addition to all these good qualities, hard rubber is a permanent battery insulator.

Battery separators may be had either with or without ribs and with perforations ranging from 16½ per cent to 29½ per cent porosity, representing the proportion of the area of the perforations to the total area. Ribbed separators should have a sheet thickness of 1/32 inch.

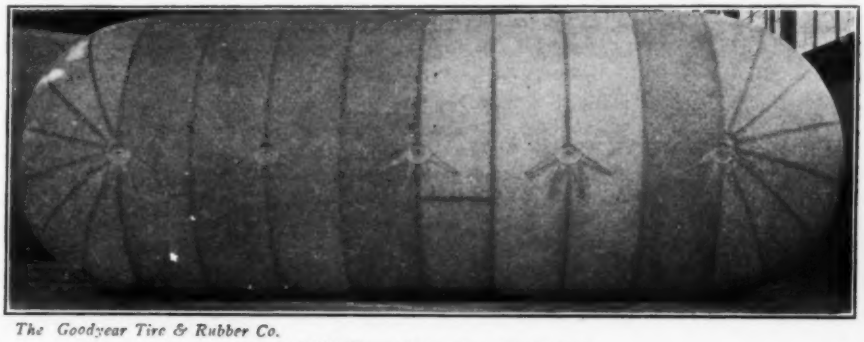
NEW USE FOR GAS CONTAINERS

THE POSSIBILITY of using gases extensively in new processes of vulcanization, such as Peachey's, at once suggests storage containers other than tanks which are weighty and not easily moved about. The solution is the gas bag made of rubberized fabric, a container whose prime function is to hold gas and not to lift a load.

The rubber gas bags used on London buses during the war, when motor fuel became so scarce that gas was used in its place, demonstrated that this sort of container was entirely practical and, when properly constructed, perfectly safe. Needless to say, the sudden demand for these containers resulted in all sorts of flimsy structures being used, with disastrous results in some cases. The government formulated rigid specifications for gas bags, providing that two-ply diagonally doubled cotton wigan textile should be used, impregnated with a primary coat of rubber and then proofed with six coats of rubber containing not less than 90 per cent of first-grade native or plantation rubber, the weight of the proofing to be six ounces per square yard between the plies. These requirements seem to have resulted in a stagnation of the industry and the later abundance of fuel resulted in disuse of gas bags.

In designing fabrics for gas containers, weight need not be considered, and as a result the containers are built of heavy fabrics to insure long wear and great resistance to pressure. In the case of gases used for vulcanizing, it has not yet been ascertained that the two gases would not be destructive to a rubber gas bag. An inside coating such as is used in gas tubing might obviate trouble.

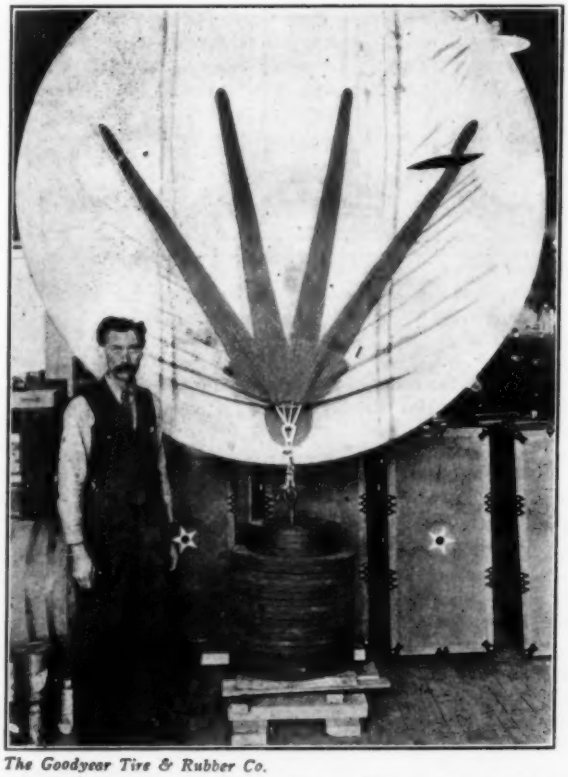
Big rubber gas bags have been used successfully as reservoirs in connection with dirigibles. For companies having a small output of gas as a by-product, cylindrical containers, which can be suspended readily in the average size room, offer the logical means for handling this supply of gas. For laboratory use or for plants where only small amounts of gas are handled, small spherical containers will be found convenient.



The Goodyear Tire & Rubber Co.

A 5,000-CUBIC-FOOT GAS CONTAINER

Gas containers are moored by means of the ingenious finger-patch which shows so clearly in the illustration. This clever device distributes the strain so that there is no disrupting pull on any part of the rubberized fabric.



The Goodyear Tire & Rubber Co.

SUSPENSION TEST OF A FINGER PATCH WHICH FAILED WHEN A LOAD OF 2,000 POUNDS WAS APPLIED

SANITATION IN RUBBER MILLS

JUST as the old-fashioned, dingy, untidy store rather repelled than attracted trade, and as its depressing atmosphere lessened the interest and enterprise of its clerks, so, too, in the grimy, dimly-lighted, and unsanitary old-fashioned workshop the morale and ambition of the workers usually struck a low average. The dissatisfied employer generally ascribed the listlessness of his helpers and the relatively small output to everything but the real cause—a lack of healthful and agreeable surroundings for his employes. The modern merchant has achieved success quite as much by his eagerness to better working conditions for his help as by astute merchandising; and the up-to-date manufacturer has quite as well learned the lesson that safety, comfort, sanitation, and general cleanliness for employes have economic importance, apart from ethical and esthetic consideration. Popular education is also playing its part in bringing about improved conditions. Labor associations are growing more exacting than ever about favorable working conditions for their members. Hence it seems fair to assume that in the near future the factories that will get the choice help will be those only that offer to workers the cleanest, most healthful, and most agreeable surroundings.

In an address on "Industrial Sanitation,"[1] the results in progressive manufactories of an intelligent study of the workers' health and comfort, and detailed means employed to bring about better working conditions, were interestingly reviewed. As beneficent measures of prime importance, ample light and pure air, especially air free of dust and noxious vapors, were stressed. Windows should be transparent, not merely translucent; walls and ceilings be dustless and grimeless if they would function as they should in the scheme of illumination;

[1] By W. N. Fitch, director of accident prevention and sanitation, The B. F. Goodrich Co., Akron, Ohio. Paper read before the Rubber Division of the National Safety Council at Milwaukee, Wisconsin, September 30, 1920.

the broom and the brush should be banished and both replaced with the vacuum cleaner, portable time and money-saving types of which having recently appeared; workers should be required to place all rubbish in fire-proof containers; an ample supply of drinking water should be provided, tested daily by a bacteriologist, and used with individual cups. If Bristolware jars be used they should be filled from a wheeled tank with a pump and hose attached, but preferably an automatically-cooled circulating system should be used for distributing the water, provided with non-contaminating founts at convenient points and cleaned daily. Even the lowly cuspidor could be standardized, and the speaker showed how these "necessary evils" are best collected, cleaned, and steamed.

Proper toilet accommodations in factories are given too little attention. Even when of modern construction, they are often so placed that workers lose much time in reaching them, they are often set where light and ventilation are insufficient, they are not automatically flushed, and locks are put on doors where springs would serve as well and tend to lessen loafing, etc. The placing of a small, porcelain, non-stopper, spray-head lavatory with foot-valve control is suggested for each five toilets or less, and special care urged in draining and cleaning toilet rooms. Stress is laid, too, on the importance of providing metal, ventilated, combination-padlocked lockers for clothing and lunches, and suitable washing units on the same floor. One of the best forms of the latter, it was stated, is of white enamel, eight feet long, with five spray-head goosenecks with liquid soap dispensers between them, and with box foot-control valves. Individual linen or paper towels are used.

The value of shower baths is also pointed out, and it is urged that they should be provided for all workers whose tasks are very dirty, who have to handle poisons, or who completely change their clothing on entering and leaving a factory. There is not enough attention devoted to the lunch room. Indeed, while many industrial managers often score notable success in enhancing the health, comfort, and efficiency of workers in their care through all the departments of a big factory, they fail in their regulation of the lunch room. Here, it is pointed out, sanitation is just as necessary as in all other sections of a mill, and good food is a factor of no mean importance in keeping an industrial army, just like a fighting one, in a fit condition.

PNEUMATIC TIRES CRITICIZED

AN INTERESTING CRITICISM of present-day pneumatics appears in a letter by W. J. P. Moore, of New York City, to the editor of *Automotive Industries*. In discussing the possible adaptability of pneumatic tires for heavily loaded motor trucks, the writer asserts that the principle of construction as embodied in the round pneumatic tire is wrong, and the fundamental idea, resiliency, for which the tire is designed, is in effect defeated because of the high pressure to which the tires are pumped. This high pressure is necessary to maintain the shape of the tire (not to carry the load), and thus prevent working or intermovement of the dissimilar materials of the tire wall, the fabric or cord and the rubber composition.

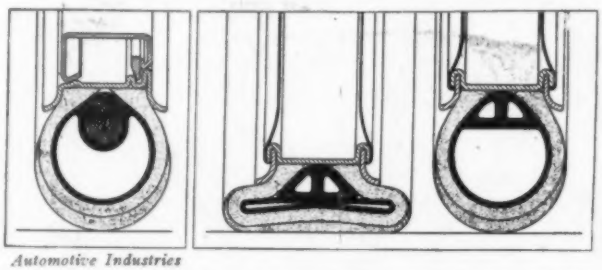
Mr. Moore proposes a two-fold remedy: (a) Improve the quality and strength of the rubber, have only one homogeneous material (as in a solid tire), and do away with internal movement, friction and heat of the dissimilar elements. (b) If it is impossible to find a suitable rubber composition, the shape of the pneumatic cord tire should be designed so that with lighter air pressures the deflection would be so modified as not to injure the fabric and also produce better riding qualities.

As long as we continue to use the present form of round tires, he asserts, some form of base filler strip should be introduced, (as shown in the illustration herewith), so as to prevent the tire being cut by riding on the rim in case of deflation. A tire so protected could be safely driven to the journey's end. Such a device is patented and in use in Germany, but not in this country.

Having started with light tire loads, the round tire was perhaps the natural evolution, Mr. Moore contends, but had we started with larger tires and heavier loads it is possible that an entirely different form of tire would have been evolved. He supports this contention by citing the analogous mechanical problem of constructing a building with spherical or double-curved walls. (Imagine a Woolworth building with such walls!) The problem is easy until you add weight to the structure, when you must add cross-stays to stiffen the curved side walls, as in the Eiffel tower at Paris. The round pneumatic tire typifies this construction, with high air pressure to act as cross-stays on the tire walls. A better construction, he suggests, would be an Eiffel tower effect with a broad base, producing a pneumatic suspension combined with partial or indirect compressibility in a tire, with only necessary air pressure to carry the load without straining the fabric.

If the desired effect cannot be produced with the round tire carrying lower air pressures, the solution must be sought along the lines of a broad base construction, since it appears unreasonable to have, say, a ten-inch depth of air when the actual flattening is from one to four inches, even when striking sudden obstructions.

Another outstanding defect of present tire construction, concludes Mr. Moore, seems to be the depth of the side ring of the rim. This is unnecessary in the present straight-side tires, and the deeper the side ring, the heavier the car rides upon it, unless a filler as suggested is used.



Automotive Industries

SUGGESTED PNEUMATIC TIRE DESIGN —ALL RUBBER

BASE FILLER STRIP SUGGESTED FOR PRESENT PNEUMATIC TYPE

"TREADO" TO REPAIR RUBBER GOODS

A new prepared rubber used to rebuild worn treads, and rut-worn tires, is called "Treado." It is claimed to require no cement, heat or patches. It may also be used for mending leaky rubbers and rubber boots, rebuilding rubber belts, fiber soles, rubber soles and heels, etc.—Treado Manufacturing Co., 42 Dwight street, Springfield, Massachusetts.

"LASTAWL" FIBROUS RUBBER SOLING

Another British product is a set of sole and heel pads made of composition rubber and fiber material which is called "Lastawl" fibrous rubber soling. The pads are to be attached to the bottom of a shoe and are intended to preserve the expensive leather sole from wearing out. The long-wearing qualities of the rubber and fiber soling offset the original cost of the pads, which are adaptable to fit any size boots or shoes.—The Lastawl Co., 132-148 Boundary street, Liverpool, England; British & Foreign Agencies Limited, 17 St. John street, Montreal, Quebec, Canada.

What the Rubber Chemists Are Doing

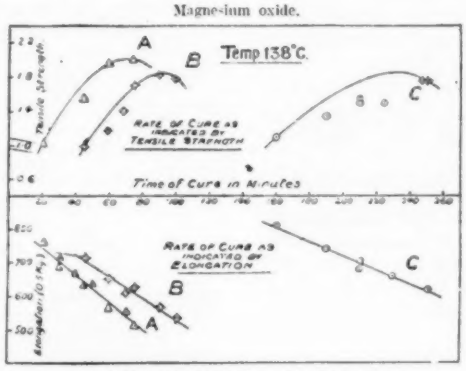
Acceleration of Vulcanization—II[1]

A DISCONTINUITY IN THE EFFECT OF VULCANIZATION

IN THE previous paper on the above subject[2] the results were given of comparative experiments with aldehyde ammonia, *m*- and *p*-phenylenediamine, thiocarbanilide, and hexamethylene tetramine.

The present paper contains the results of further tests. The method of procedure was the same as that adopted earlier, the most important feature being the use of a heated bath of oil for vulcanization of the samples, whereby the periods of vulcanization are rendered more definite than with steam heating.

Fig. 1 represents the progress of vulcanization of the standard mixing (pale crêpe rubber 90, sulphur 10) with and without the addition of 1 per cent and 0.4 per cent of a high-grade, light calcined magnesia. Judging the rate of vulcanization by the period required for the attainment of maximum tensile strength, the acceleration factor[3] for the magnesium oxide in question is approximately 3.3 and 2.5 respectively for 1 per cent and 0.4 per cent; the presence of the finely dispersed particles of undissolved magnesium oxide somewhat affects the extensibility of the rubber, and the acceleration factor assessed by the periods required for the reduction of the extensibility at 0.5-kilogram per square millimeter to 650 per cent possesses a slightly exalted value.



A, 1% MgO; B, 0.4% MgO; C blank (S = 10%).

Fig. 1.

In Fig. 2 is represented the effectiveness of 0.5 per cent of potassium hydroxide introduced as a solution in three times its weight of glycerol.[3] The acceleration factor, judged by the tensile strength method or by the period for the production of extensibility of 650 per cent, has a value between 3 and 4, which compares very favorably with many popular organic accelerators at the same concentration and is approximately equal to the factor for the magnesia in the preceding experiment at twice the concentration.

The insistence of supporters of the use of thiocarbanilide that this substance needs the simultaneous presence of zinc oxide for the development of its catalytic effect, was suggestive of the possibility that the active substance might really be carbodiphenylimide, $C(:N.C_6H_5)_2$, produced from the thiocarbanilide, $CS(.NH.C_6H_5)_2$, by the desulphurizing effect of the zinc oxide, and which is known to be remarkably active chemically. An experiment made with a sample of carbodiphenylimide prepared by the action of mercuric oxide on thiocarbanilide in benzene solution revealed no marked catalytic activity, but on account of the easy polymerization of carbodiphenylimide this evidence could not be regarded as final, and it was considered necessary to produce the carbodiphenylimide *in situ* by the interaction of the thiocarbanilide and mercuric oxide in the rubber mixing.

Parallel vulcanization experiments were therefore made, using (*a*) the standard mixing of rubber 90, sulphur 10; (*b*) the standard mixing with the addition of 1 per cent of thiocarbanilide and 3 per cent of yellow mercuric oxide; and (*c*) the same mixture as in (*b*) but without the thiocarbanilide. The results given in Fig. 3 show that mixture (*b*) possesses no marked advantage in rate of vulcanization relative to (*c*), and that any advantage in rate of

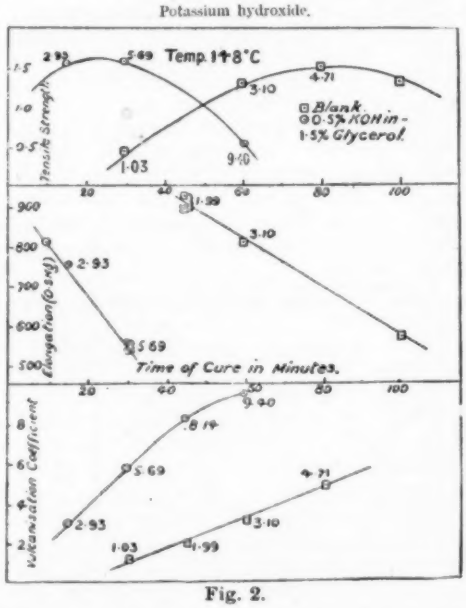


Fig. 2.

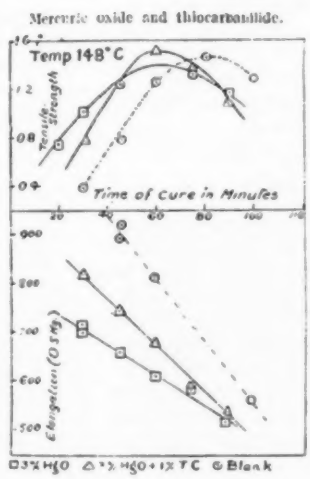


Fig. 3.

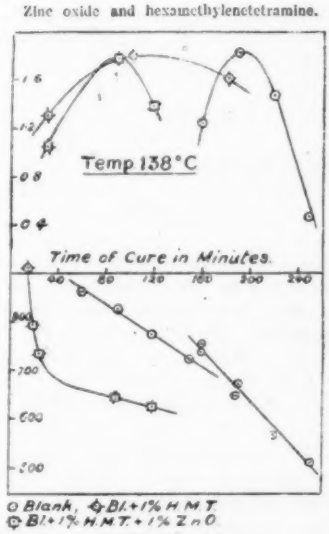


Fig. 4.

potassium hydroxide introduced as a solution in three times its weight of glycerol.[3] The acceleration factor, judged by the tensile strength method or by the period for the production of extensibility of 650 per cent, has a value between 3 and 4, which compares very favorably with many popular organic accelerators at

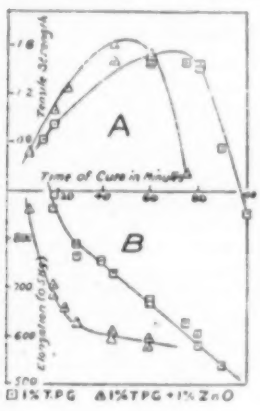
[1] D. F. Twiss and C. W. Howson, Journal of Society of Chemical Industry, August 31, 1920, pages 287-289T.
[2] Part I, D. F. Twiss and S. A. Brazier, Journal of the Society of Chemical Industry, May 15, 1920, pages 125T-132T; abstract, THE INDIA RUBBER WORLD, August 1, 1920, pages 730-732.
[3] See Twiss, Journal of the Society of Chemical Industry, 1917, page 1185.

vulcanization imparted to a mixing by the introduction of thiocarbanilide cannot be ascribed to the formation of carbodiphenylimide. It is noteworthy, however, that the curves for mixing (*c*) indicate marked catalytic power on the part of the mercuric oxide, which, indeed, might have been expected from the basic character of this substance.

Reference to the previous paper[3] reveals the remarkable fact that, although the mixing containing the organic catalyst, together with zinc oxide, vulcanizes much more rapidly than the blank mixing, the slope of the extensibility or elongation curve in the lower part of the diagrams, instead of being steeper, tends to be more gradual. Closer examination of the behavior of mixtures of this composition reveals the fact that the extensibility curve in question undergoes a remarkable change of direction at an early stage of the vulcanization process. A similar phenomenon is observable with a rubber-sulphur mixing containing as accelerator a mixture of triphenylguanidine and zinc oxide. The results are reproduced in Figs. 4 and 5. In both cases the extensibility at first decreases very rapidly with increasing vulcanization, but finally assumes a much more gradual rate of change.

The presence of zinc oxide appears to be favorable, if not conditional, to the occurrence of the inflexion in the extensibility curve within the usual range of vulcanization. From the results

Triphenylguanidine and zinc oxide.



Curves show rates of cure as indicated by (A) tensile strength, (B) elongation.

Fig. 5.

Aldehyde-ammonia and zinc oxide.

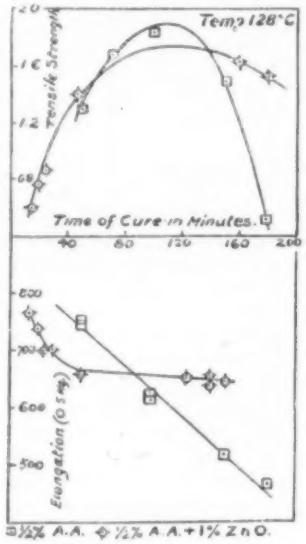
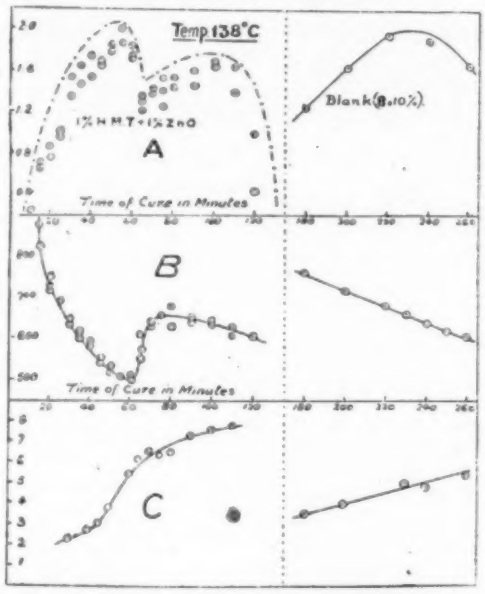


Fig. 6.

given in the previous paper it is evident that no indication of such inflexion exists in the extensibility curves for the mixings, containing aldehyde ammonia. When the aldehyde ammonia is used in conjunction with zinc oxide, however, an inflected extensibility curve is obtained, as is demonstrated by the results in Fig. 6. No such inflexion appears to occur in the progressive vulcanization of the standard rubber-sulphur mixing with the addition of thiocarbanilide and zinc oxide. It is possible, however, that when the bend appears to be absent the extensibility curve undergoes a change of direction at a stage of vulcanization beyond the range of convenient testing.

By concentrating the number of tests around the point of inflexion of the extensibility curve for the hexamethylene tetramine-zinc oxide mixing it is found that, in at least this case, the curve in reality undergoes a double inflexion within a short interval of time, Figs. 7 and 8.[4] This surprising result has been

Hexamethylenetetramine and zinc oxide.

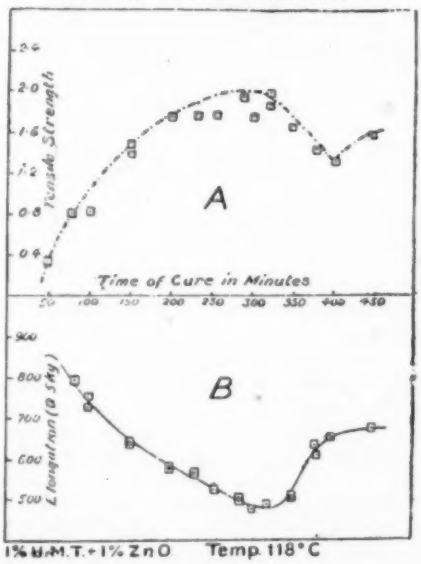


Curves show rates of cure as indicated by (A) tensile strength, (B) elongation, (C) vulcanisation coefficient.

Fig. 7.

confirmed by repeated reinvestigation with different mixings of the same composition vulcanized at the same and different temperatures. The results also indicate some concomitant discon-

Hexamethylenetetramine and zinc oxide.



Curves show rates of cure as indicated by (A) tensile strength, (B) elongation.

Fig. 8.

tinuity in the tensile strength and combined sulphur curves, but the actual outline of the tensile strength curves in Figs. 7 and 8 is given with a certain amount of reserve on account of the somewhat greater variability in the values obtainable. It is note-

[3] Part I, D. F. Twiss and S. A. Brazier. Journal of the Society of Chemical Industry, May 15, 1920, pages 125T-132T; abstract, THE INDIA RUBBER WORLD, August 1, 1920, pages 730-732.

[4] The effect, which is observable over only a small range of concentration, is probably to be attributed to the physical nature of the zinc oxide as an exceedingly fine powder rather than to its chemical nature; 1 per cent of carbon black (gas black or lampblack) introduces a similar irregularity.

worthy that the inflexion in the extensibility curve occurs at a vulcanization coefficient of 4 to 5, indicating that the first peak in the tensile strength curve represents the ordinary "optimum cure," and that the subsequent peak is the abnormal one. It may also be observed that the maximum extensibility attained just after the inflexion of the curve, has approximately the value of 650 commonly observed at the tensile optimum of a rubber-sulphur mixing vulcanized under ordinary conditions. The explanation of this unexpected irregularity in the alteration in the physical characteristics of the rubber is not at all obvious. It appears probable that the two sections of the extensibility curve indicate two distinct processes causing alteration in the physical characteristics of the rubber, the point of inflexion representing the stage at which the one preponderating earlier is overtaken by the other, which then becomes predominant.

From the curve in Fig. 7 it will be seen that for one mixing it may be possible within a small range of cure to apply three distinct periods of vulcanization and yet to obtain identical extensibility in the resulting rubber in spite of the three different vulcanization coefficients. Such a result, which is independent of the further complications introduced into the relation between the physical properties and the vulcanization coefficient by subsequent aging,[2] serves to emphasize more strongly than ever the lack of simplicity in the relationship between the physical alteration effected in rubber during vulcanization and the chemical change by which this alteration is induced.

LITHOPONE[1]

Anhydrous zinc sulphide is prepared from hydrated sulphide by treating zinc hydroxide, heated to 90 to 100 degrees C. by means of steam, with sufficient sodium sulphite. The resulting caustic soda is decanted off and is used to prepare a fresh amount of zinc hydroxide from zinc sulphate. Periodically it is necessary to purify the caustic soda by crystallization and to reject the mother liquor which becomes charged with impurities.

The precipitation of the zinc hydroxide is performed hot to avoid the formation of a gelatinous product of low density, and the sodium sulphate simultaneously produced is used to prepare barium sulphate and sodium sulphide from barium sulphide. The latter is obtained by the reduction of barium sulphate by means of carbon, thus completing the cycle in which zinc sulphide and precipitated barium sulphate are obtained from zinc sulphate, barium sulphate and carbon. The hydrated zinc sulphide after being washed free from alkali is filtered and dried at 100 degrees C. or in a vacuum. It is then mixed with sulphur and heated to 450 to 500 degrees C. in a muffle furnace, thereby volatilizing any cadmium sulphide, and allowed to cool with exclusion of air.

To prepare lithopone, the precipitated barium sulphate, after washing and drying, is mixed with the desired proportion of zinc sulphide in a revolving horizontal iron cylinder and finally passed through a sieve.

VULCAZOL

The following is quoted from André Dubosc in *Le Caoutchouc et la Gutta-Percha*, September 15, 1920:

"Theoretically," says Spence, "the number of accelerators is infinite and probably the best have not yet been found."

I will not say that Vulcazol, the latest of catalyzers of vulcanization, the remarkable properties of which I have investigated, may not be the ideal body to which Spence referred, but certainly it is one of the most active and interesting among the accelerators actually tested. This singular aldehyde is furfurol derived by condensation with ammonia, and belongs to the group of hydramides. These are neutral nitrogenous bodies formed by the action of aromatic aldehydes and of furfurol on ammonia. Three molecules condense with two molecules of alkali, eliminating two molecules of water, and the action is reversible according to the equation:

$$3\,(C_5H_4O) + 2\,NH_3 = (C_5H_4)_3N_2 + 2\,H_2O$$

They are solid, crystalline, slightly soluble in water, soluble in alcohol and ether and decompose by volatilization.

By boiling with water or by the action of dilute acids many of them decompose into aldehyde and ammonia, such as hydrobenzamide, hydrosalicylamide and furfuramide. If held for some time at a temperature higher than their melting point, or treated with boiling potash, they are changed into basic isomers which act as true alkaloids.

Hydrobenzamide furnishes also amarine, anishydramide, anisine, furfuramide and furfurine. Five hydromides are known, namely: hydrobenzamide, cuminhydramide, anishydramide, hydrosalicylhydramide, and furfuramide or furfurol.

[1] British Patent No. 147,658.
[2] Reports of the Progress of Applied Chemistry, 1919, 4, 338.

METHODS OF ANALYSIS

COLORIMETRIC DETERMINATION OF LEAD DIOXIDE IN LITHARGE

THE following method, devised by W. V. Morgan, is taken from the *Journal of Industrial and Engineering Chemistry*, November, 1919. It is intended for the determination, in a semi-quantitative way, of lead dioxide in the presence of litharge, and has been used to advantage in connection with rubber work where it is important to know the amount of oxidizing agent present. The method with slight alterations is applicable to the determination of oxidizing agents in general where they occur as an impurity with non-oxidizing agents.

METHOD

A definite amount of litharge, for example, five grams, is boiled for a minute with a solution containing two grams of aniline hydrochloride dissolved in 10 cc. of water and five cc. of concentrated hydrochloric acid. The solution is then cooled to separate any lead chloride which has formed, then filtered to remove the lead chloride and any litharge which has not been dissolved. It is not necessary to convert all or part of the litharge into lead chloride as the action depends upon the oxidizing power of the dioxide only. The filtrate is compared with standards made by adding definite amounts of lead dioxide to the above-mentioned solution. A colorimeter may be employed to estimate the amount of aniline purple formed, or the solutions may be compared in suitable receptacles.

The lead dioxide oxidizes the aniline to aniline purple. The intensity of the color is proportional to the lead dioxide content.

CHEMICAL PATENTS

THE UNITED STATES

RUBBER SUBSTITUTE AND PROCESS FOR PRODUCING IT, CONSISTING of treating by heat a mixture of fixed oils and sulphur substantially free from air and moisture under pressure until the period of the elements reacting has ceased.—Harry H. Haseltine and Morton Gregory, Tacoma, Washington, assignors to Western Rubber Co., Tacoma, Washington. United States Patent No. 1,360,744.

THE UNITED KINGDOM

UTILIZING WASTE RUBBER. THE SEPARATION AND RECOVERY FOR re-manufacture of textile materials and rubber from such articles as automobile or bicycle tires is effected by treating the coarsely ground fragments with a solvent under heat in a closed drum. The mass is worked mechanically until all the rubber is dissolved, when the solution is run off and distilled to obtain the rubber. The extracted textile material is adapted to paper making.—F. Waitz, 78 Obernstrasse, Bremen, Germany. British patent No. 19,585.

VULCANIZING INDIA-RUBBER BY HEATING IN AN ATMOSPHERE OF volatile alkali, such as ammonia or organic alkali, and air, which may also contain inert or reducing gases. About 250 grams of ammonia are used for every cubic meter capacity of the vulcanizing chamber. Thick articles may necessitate the employment of pressure, obtained preferably by the use of previously compressed inert or reducing gases.—E. Tilche, 67 Rue de Tocqueville, Paris. British patent No. 148,350.

GERMANY

VULCANIZED PRODUCTS, SOFT, ELASTIC, DUCTILE AND TENACIOUS, are produced by use of the following chemical substances: (a) ammonium compounds, aliphatic or aromatic amines, or their derivatives or salts, such as diphenylamine, diethylaniline, formanilide, dimethylaniline, dimethyltoluidine, to the extent of 5 per cent or more, and/or (b) aniline sulphate, which in small quantities acts as an accelerator, are added to the materials during vulcanization.—Farbenfabriken formerly Friedrich Bayer & Co. German patents Nos. (A) 303,984 and (B) 305,667.

THE DOMINION OF CANADA

VULCANIZATION OF RUBBER. THE METHOD OF ACCELERATING vulcanization which consists in adding to the mixture to be vulcanized an anhydrous compound resulting from the interaction of strongly basic substances with the nuclear monohydroxy derivatives of benzene in which the hydrogen of the hydroxyl group is replaced by the radical.—The North British Rubber Co., Limited, assignee of Benjamin Dawson Porritt, both of Edinburgh, Scotland, Canadian patent No. 204,387.

RUBBER LIQUID DRESSING FOR SURFACES OF LEATHER AND THE like, comprising a quickly drying combination of a relatively large quantity of asphaltum, a volatile solvent, a relatively small quantity of rubber cement, and a relatively still smaller quantity of black pigment, beeswax and Japan drier.—Alfred R. Caldwell, Whittier, California, U. S. A. Canadian patent No. 204,458.

TIRE CORE FOR VEHICLE TIRES, CONSISTING OF RUBBER MATERIAL formed of approximately 40 parts pure Fará rubber; 20 parts vulcanized rubber; five parts rosin oil; ten parts zinc oxide; five parts petroleum; ten parts flour of sulphur; five parts ammonium carbonate and five parts baking powder, all amalgamated and vulcanized.—Carl Elwood Judson, Toronto, Ontario, Canada. Canadian patent No. 204,467.

VULCANIZING PROCESS WHICH COMPRISES HEATING UNDER vulcanizing conditions a mixture consisting of rubber-like material, sulphur and amino-methyl-isopropyl-benzene.—The Selden Company, assignee of Chester Earl Andrews, all of Pittsburgh Pennsylvania, U. S. A. Canadian patent No. 204,779.

WOOD SUBSTITUTE FORMED BY A PROCESS WHICH CONSISTS IN building up in a mold a plurality of layers of coir fibre mingled or impregnated with a vulcanizable rubber, compressing the composition and vulcanizing it.—George Daubney Rose, Manchester, England. Canadian patent No. 205,163.

ARTIFICIAL RUBBER. AN ELASTIC COMPOSITION COMPRISING GLYcerine, 2¼ pounds; glue, 5⅝ pounds; water, 9 pounds; tannic acid, 2¼ ounces, and a solution of formaldehyde, 4 ounces.—Ernest E. Cathcart, Tecumseh, Nebraska, U. S. A. Canadian patent No. 205,403.

VULCANIZING RUBBER. A PROCESS WHICH CONSISTS IN ADDING to the mixture of rubber and other materials a small proportion of a nitrogen derivative of furfuryl and heating the mixture under usual vulcanizing conditions.—La Société Ricard, Allenet & Cie., assignee of Eloi Ricard, both of Melle (Deux-Sèvres), France.—Canadian patent No. 205,728.

OTHER CHEMICAL PATENTS

THE DOMINION OF CANADA

NO. 205,701 Coated fabric having base coating containing rubber and no nitrocellulose, surface coating containing nitrocellulose and no rubber, and intermediate coatings containing increasing quantities of nitrocellulose and decreasing quantities of rubber as they approach the surface. The Canadian Fabrikoid Limited, Montreal, Que., assignee of E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A., assignee of H. W. Matheson, Montreal, Que.

GERMANY

PATENT APPLIED FOR, WITH DATE OF APPLICATION

86,268 (May 3, 1918.) Method for the production of synthetic product similar to caoutchouc. Badische Anilin-und-Soda Fabrik, Ludwigshafen, Germany.

PATENTS ISSUED, WITH DATES OF ISSUE

303,224 "K" (October 3, 1916.) Filling materials for the manufacture of soft and hard rubber goods. Farbenfabriken formerly Friedrich Bayer & Co., Leverkusen, near Köln-on-Rhine.

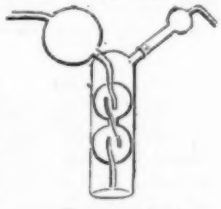
329,593 (November 1, 1918.) Method of manufacturing substances similar to caoutchouc. H. Otto Traun's Forschungslaboratorium G. m. b. H., Hamburg.

329,676 (May 4, 1918.) Method of manufacturing substances similar to caoutchouc. Badische Anilin-und-Soda Fabrik, Ludwigshafen-on-Rhine, Germany.

LABORATORY APPARATUS

POTASH BULB

THE ILLUSTRATION shows a potash bulb of the Bender and Holbein type. The two bulbs shown herewith are filled with caustic potash solution to the tops of the outflow tubes and a slight excess of solution is added for the outer space. The potash bulb is operated for carbon dioxide absorption by allowing the gas stream to enter the bulb so that the gas must bubble through each bulb and through the outside solution, finally leaving the apparatus through the calcium chloride tube, which retains moisture that otherwise would be carried out, thereby causing loss of weight.—Scientific Utilities Co., Inc., 18 East 16th street, New York City.



POTASH BULB

LABORATORY FILTRATIONS

Efficient laboratory filtrations are readily effected either industrially or for analytic purposes through amphibole asbestos of the actinolite and tremolite varieties, which come as long, short and woolly fibers adapted for technical and commercial filtration, prepared by an American concern.—Powhatan Mining Co., Baltimore, Maryland.

PLATINUM CRUCIBLE WITH CAPSULE COVER

PLATINUM CRUCIBLE

For determination of volatile matter in coals and coke by the standard method given in Technical Papers Nos. 8 and 76, United States Bureau of Mines, a platinum crucible with a capsule cover is used, as shown in the illustration. The percentage of volatile matter obtained by the use of such a crucible at 10-cc. capacity is slightly lower than that obtained by the use of a 30-cc. crucible with ordinary cover, due to the fact that the loss in weight of the sample under test is usually less than 0.3 per cent with the capsule-covered crucible while it often amounts to one per cent in a crucible with flat cover.—American Platinum Works, Newark, New Jersey.

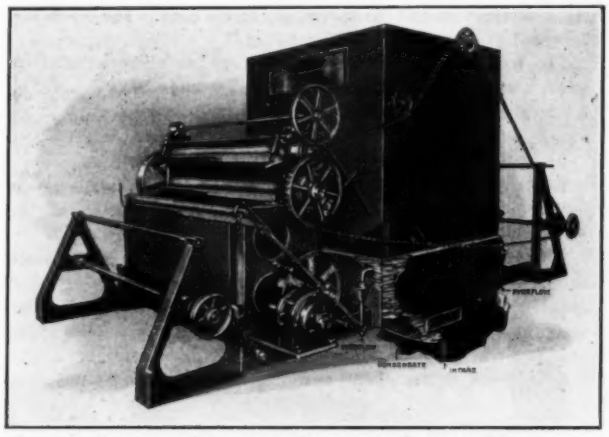
"CRUDE RUBBER AND COMPOUNDING INGREDIENTS" should be in the library of every progressive rubber man.

New Machines and Appliances

SOLVENT RECOVERY APPARATUS

THE importance of conserving the health of rubber workers exposed to the fumes of benzine and safeguarding them from the danger of explosion when benzine gas mixed with air reaches a proportion between 28 and 44 per cent is fully appreciated in the industry. In providing means for preventing the escape of benzine gas into mill rooms, rubber manufacturers could, while benefiting their employes, also benefit themselves by installing aparatus which would not only check the spread of the noxious and dangerous fumes, but also collect and liquefy the free volatile hydrocarbon and make it again available as a solvent.

With modern apparatus this result has been accomplished in a high degree and with marked improvement in the health and comfort of millroom workers, not to mention the reduction in insurance rates due to the decreased danger from fire. Calenders, spreaders and impregnators may be provided with gas-tight housings, and by a water cooler the evaporated benzine is condensed on the floor of the housing, whence the liquid is conveyed to the benzine tank, the piping being safeguarded with special devices against fire. Safety valves in the upper half of the housing raise automatically should an explosion occur, and return at once to the former position after an explosion, thus instantly reestablishing the gas-tight inclosure. It is said that with such vents practically no harm can result from any blast. Even though a fire



SOLVENT RECOVERY APPARATUS APPLIED TO BANNER IMPREGNATOR

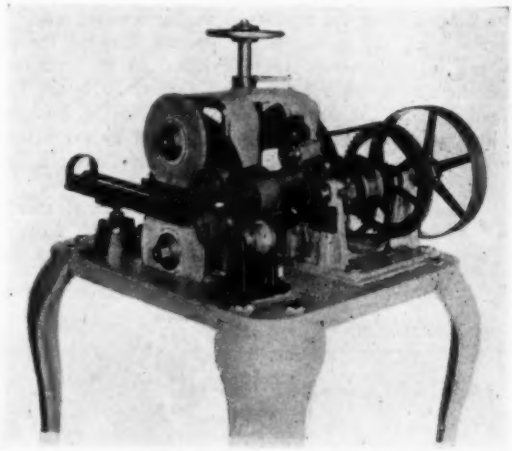
followed inside the housing, it would extinguish itself through lack of atmospheric oxygen. In one test it was shown that 85 per cent of the evaporated benzine was recovered, 10 per cent passed into the finished product, and but 5 per cent was lost.

Recent applications of the benzine solvent recovery device have been made successfully to a spreading machine and a horizontal calender used in making asbestos packing, and also to an impregnator used in making cord tire fabrics. In the device used on the latter, gasoline or benzol can be recovered quite as readily as benzine.—Benzine Condensation Co., Inc., 224 West 42d street, New York.

MACHINE FOR TRIMMING MOLDED HOSE

The rind or overflow from molded hose, carriage tires, bead fillers or any of the various rubber products of a similiar nature is readily removed by this device. The machine is quickly adjusted to all the different sizes of hose and operates at an average capacity of 3,500 linear feet an hour. However the capacity has been known to be increased to 6,000 linear feet an hour. Both sides are perfectly and uniformly removed at one operation. The guide trough between which the hose travels and through which the abrading wheel operates, is constructed in such a manner that the hose cover cannot be injured in the process of trimming.

Attached to the machine is a measuring mechanism that accurately records all hose trimmed. By disconnecting the abrad-



HOSE TRIMMING MACHINE

ing parts the machine can be used for measuring only. The complete machine is mounted on an iron table to which is attached four wrought-iron legs with casters for portability.

An additional claim put forth by the maker is that a most inexperienced workman will get excellent results with this device.—Frank C. Moore, Canton, Ohio.

TUBE AND AIR BAG INSERTING MACHINE

Tire manufacturers will be interested in this machine for opening tires, inserting and removing tubes and air bags. One of the chief claims is that one man can tube or bag tires equivalent to the labor of three men by the hand method.

THE FINCH TIRE OPENER

In operating the machine the casing is placed on the table, engaging four adjustable slides on the lower bead of the tire and four swinging arms on the upper bead. The tire is then uniformly opened by pressure of the foot treadle. The air bag is quickly and easily inserted. A round wooden breaker laid across the tire holds the air bag in position until both sides of the bag enter the casing. The air bags are removed by using a tool designed to enter into the tire and lift one side of the bag out, so that it can be readily picked out by hand without breaking or injuring it.

A statement has been made to the effect that by using this device one air bag can be used to cure approximately 100 tires. Whereas by the old method, the average life of the bag was from 8 to 12 tires.

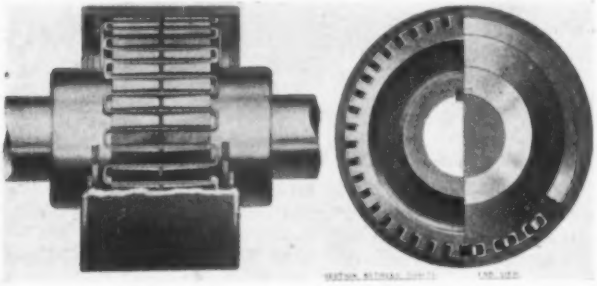
This machine is adjustable to all sizes of tires from 30 by 3½ to 37 by 5 inclusive. The machine is portable and can be moved to the different departments of the factory.—Akron Gear & Engineering Co., Akron, Ohio.

COMPENSATING COUPLING FOR MILL LINES

Rubber manufacturers will be interested in the performance of this flexible coupling, a feature of which is a large overload capacity equal to five or six times the normal value.

The coupling consists of two flanged bosses, one keyed to each shaft end, a steel spring and a shell. The continuous spring is placed in the pitched cross grooves around the circumference of the flanges, filling the grooves at the outer edges only. Under a normal load, the spring is unsupported between the outside ends and is consequently very flexible. As the overloads increase the spring bears further and further along the faces of the grooves and the unsupported span of spring becomes less and less, the increase in load is thus set off by the decrease in span. The stress in the spring does not therefore increase proportionately with the load.

The torque is equally distributed over a large number of units. The spring acts on the outsides of both flanges, thus permitting the coupling to be small in diameter and light in weight. The shape of the spring is such that no end thrust is



FLEXIBLE SHAFT COUPLING

produced between the shafts, which are free to float within limits. The only force exerted between the two shafts is torsion.

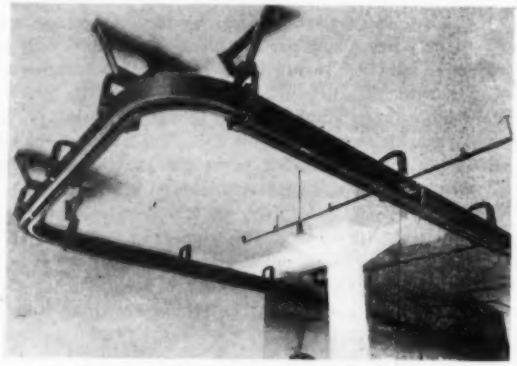
The small diameter and the freedom from end thrust allow the cover ring to be a plain cylindrical shell with a grease-retaining ring at each end. This shell is not put on until after the bosses are keyed to the shafts. The safe running speed of this coupling is higher than is ever required in practice. The load on each driving unit is comparatively light, and as the spring chamber is filled with grease, no wear takes place when the shafts are out of line.—Wellman Bibby Co. Limited, 36 Kingsway, London, W. C. 2, England.

NEW ELEVATOR CONTROLLERS

The C-H line of D. C. and A. C. elevator controllers has been replaced by newer types of simpler construction. The general design is the same. The new features are: standard carbon-to-copper power contacts, which are non-freezing and quiet in operation; and, time limit acceleration by a simple dash-pot relay, which is accurate in operation and provides smooth acceleration regardless of load conditions. The resister, formerly automatically inserted in the solenoid circuit, has been omitted, as the coil is of sufficient size to prevent overheating on intermittent duty, without having to reduce the current when the plunger reaches the end of its stroke.—Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin.

OVERHEAD CONVEYING SYSTEM FOR RUBBER FACTORIES

The short-turn overhead trolley, shown in the illustration, is of undoubted interest to rubber manufacturers, particularly tire makers. It is used to convey a variety of materials, also finished tires mounted on their cores, to the curing room and for carrying the cores back to the tire-building room again, etc. It is a simple system, designed to take up little space, and it is easily installed. It consists of two channels held in place by clamps and the weight is carried by supporting points naturally provided by the building. Additional supporting members are used only where necessary, such as for carrying corners or switches. The trolley runs



OVERHEAD TRACK IN A CONCRETE BUILDING

on the top of the flanges. All the trolley wheels are supplied with ball bearings and are furnished without flanges, consequently there is no binding or jamming against the track on curves. Due to these special features of construction sharp curves in the track as small as 18-inch radius are safely used. The track may be wired to operate electric hoists.

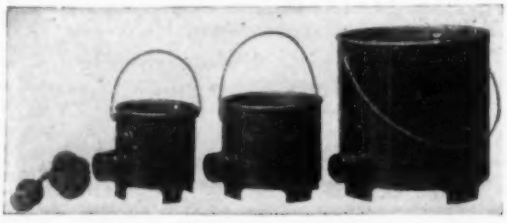
The trolleys are made with two, four, or eight wheels, and have a carrying capacity of 1,000, 2,500 and 5,000 pounds respectively.—S-T Engineering Corporation, Buffalo, New York.

ELECTRICALLY HEATED GLUE-POT

While the electrically heated pot here pictured was designed for heating glue, its utility in other directions is apparent to practical rubber men.

It is a 2-quart electric pot of the dry type, eliminating the water bath entirely. The glue-pot consists of a copper vessel contained in a steel case. It fits snugly, makes a perfect thermal contact with the heating element, and may be easily taken out for cleaning.

One of the strong claims made for this pot is, that the direct



DRY-TYPE GLUE-POT

contact insures the glue being at the right temperature all the time, that it will not burn, and that the heater cannot be burned out.—Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania.

AN IMPROVED TIRE BUILDER

Of particular interest to tire manufacturers at this time when production costs are paramount is the recent improvement in the Hermann tire building machine. Having a capacity of ten 30 by 3½-inch tires per hour and a proportionate number of larger sizes, this machine automatically guides, positively centers and marks the fabric before it is placed under tension. It is

built in two styles, the "Universal" and the "Special." The former is adapted to build either regular fabric or cord fabric up to and including 5-inch tires. The "Special" is particularly designed for building motorcycle and Ford sizes.—The Hermann Tire Building Machine Co., Columbus, Ohio.

MILL-STONE GRINDER

In the manufacture of reclaimed rubber by the mechanical process, an ordinary rubber mill is employed for coarse grinding the combined rubber scrap and fabric, following which the

BUHR MILL GRINDER

fine reduction necessary for the complete separation of rubber and fabric is done on a Buhr stone mill. The mill-stones require occasional dressing to maintain them in good operating condition. This is effected by an electrically driven abrasive wheel attached to a flexible shaft, as shown in the illustration. The particular form here shown is the Snow mill-stone grinder.—R. G. Haskins Co., 27 South Desplaines street, Chicago, Illinois.

MACHINE FOR VULCANIZING WHOLESOLES TO OLD TIRES

A great deal of interest is evinced in this mehod of vulcanizing wholesoles to old tire casings from the inside, applying the heat through the various plies of fabric, instead of outside, as formerly done. The vulcanizer consists of a heavy angle-iron frame, which

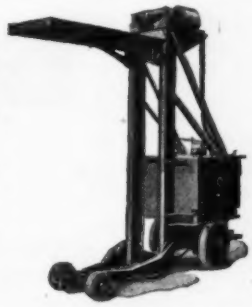
THE ENO "EXSO" VULCANIZER

supports three steam-heated sectional cores. Each adjustable core is equipped with valves and provided with a pet-cock to allow air to escape from the core while heating. The steam cocks are set to allow a little steam to escape, thus insuring live, dry moving steam necessary for perfect vulcanization.

Three tires can be operated on at the same time. Only a third of a tire is cured at one wrapping. The wholesole attached to the casing is adjusted on the core and wrapped down with wet tape. The core is tightened to give all the pressure possible during vulcanization. A fifty-minute cure is necessary. After curing, the wrapping is removed and another section of the tire is moved over the core and then wrapped for curing. In this way the capacity of the vulcanizer is raised to nine cures, or three tires a day, for each core.—George W. Eno Rubber Co., Los Angeles, California.

AN ELECTRIC INDUSTRIAL TRUCK

Many possibilities of increasing the storage capacities, or reducing the labor item for piling rolls of fabric, crude rubber, tires, molds, or other bulky materials, are offered through the use of this machine.



LAKEWOOD TIER-LIFT TRUCK

The truck frame is rigidly constructed of cast steel. The load platform of corrugated steel may be raised or lowered at will and has a carrying capacity of 4,000 pounds. It is hinged at the column end, to avoid straining the mechanism in case an obstacle is encountered when lowering the platform. The load platform is carried by a cantilever type support. The stresses set up by the load on the platform are distributed from heavy steel rollers each mounted on two annular ball bearings. The load on the platform is balanced over the load-carrying wheels which eliminates the tendency to tip when the load is raised. The motor operating the lifting or tiering mechanism is mounted on top of the columns. It is directly connected through a flexible cushion joint to a worm operating two worm-gears, each of which in turn operates vertical thread steel screws.

At the back of the truck is located the driving apparatus. The storage batteries, main drive motor, and controller are all enclosed and are absolutely dust proof. The drive motor is 24-volt, 65-ampere, with ample overload capacity. Connected to the platform on which the operator stands are the brake and operating pedals. The steering handle and operating control are conveniently placed. The truck is supplied with four wheels, having cast steel axles. The tires on the wheels are solid rubber.—Lakewood Engineering Co., Cleveland, Ohio.

AIR MOISTURE SEPARATOR

Compressed air is an important adjunct in rubber manufacture, therefore this air-cleaning device is of interest. This separator is claimed to relieve all troubles occasioned by the presence of moisture, dirt, etc., in the compressed air lines. The air enters the separator through a pipe and strikes against the casing or inside wall at an angle. This causes it to have a centrifugal action and the water or dirt consequently falls to the bottom of the separator, while the clean, pure air passes on to the pipe. There are no delicate parts to get out of order and the only attention required is to drain it once in a while.

SEPARATOR FOR REMOVING MOISTURE AND DIRT FROM AIR LINES

These separators are made in two sizes, with a capacity of 150 and 400 cubic feet respectively.—Independent Pneumatic Tool Co., 600 West Jackson boulevard, Chicago, Illinois.

MECHANICAL "TAKE-OFF" OR BATCHING ATTACHMENT FOR THE BOLTON VERTICAL BIAS CUTTER

A feature of much practical value has recently been added to the Bolton vertical bias cutter in the form of a perfected "take off" which receives the fabric strips as they are cut by the machine,

and automatically places them in books or wind-up, if books are not desired. It is claimed that even with the "take off" the cutter still occupies a minimum amount of floor space and increases the efficiency of bias cutting since it produces a great saving in labor and expense. It may be seen at the permanent exhibit on the sixth floor of the Grand Central Palace, 480 Lexington avenue, New York.—Spadone Machine Co., 126 Duane street, New York City.

INNER TUBE SPLICING BRUSH

Camel's-hair brushes are customarily used for applying pure gum cement and tube splicing acid in the manufacture of inner tubes. As a less expensive substitute, the brush here illustrated can be recommended to the trade. It is made with triple thick black Chinese bristles and in widths from 1 to 3 inches, with lengths of hair from 2 to 3 inches.—E. F. Hooper & Co., Trenton, New Jersey.

XXX CHINESE BRUSH

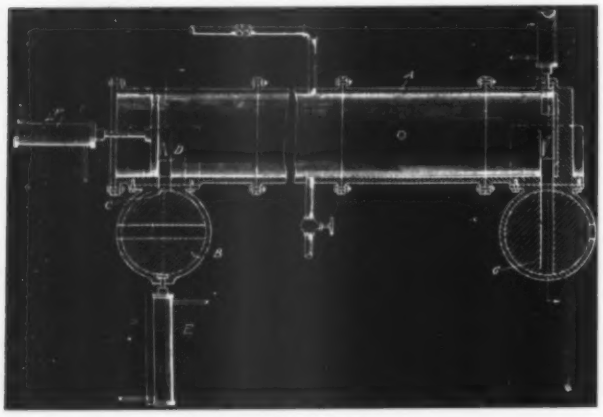
MACHINERY PATENTS

CONTINUOUS TIRE VULCANIZER

THIS invention provides a heater through which the tires pass continuously and are vulcanized, and at the same time obviates the necessity of exhausting the steam in order to remove the tires, thus eliminating a waste in labor and loss in steam.

This machine consists of a cylinder *A* of suitable diameter to allow the molds containing the tires to be passed through it. Steam of 40 pounds pressure, and at least 287 degrees F. is admitted into the cylinder through a pipe connected with the steam boiler. An exhaust pipe is also provided for the purpose of exhausting steam when necessary.

The tire encased in the mold is placed within the open chamber of the rotatable plug *B*, after which the plug is given a quarter turn. The opening containing the mold will then register with the slot *C* in the casing which is in alinement with the slot *D* in the cylinder *A*. Slot *D* is large enough to allow the admission of the mold carrying the tire into the cylinder *A*. Next the cylinder *E* is operated and its plunger passes through the open chamber of plug *B* and pushes the mold with the tire through the slot *D* into the cylinder *A*. Then the cylinder *F* is operated.



A NOVEL TIRE VULCANIZER

Attached to it is a plunger which is slightly less in size than the inside diameter of the cylindrical vulcanizer. This moves the mold carrying the tire through the vulcanizer.

The operation is repeated until the cylinder is filled with tires, and by the time the first tire reaches the end of the cylinder it has been cured and is ready to be removed. It is forced by another plunger into the open chamber of the rotatable plug *G*, which is turned until it registers with the opening or slot in the casing through which the mold is removed.—Thaddeus F. Baily and Frank T. Cope, Alliance, Ohio. United States patent No. 1,346,158.

MACHINES FOR MAKING BATTERY JARS

WILLARD'S MACHINE AND PROCESS

This invention relates to an apparatus for forming storage battery jars from rubber or rubber compound. It consists of a mandrel *A* in the shape of the jar, mounted on a flat bed *B*, and a number of dies *C* secured to hydraulic rams, which are arranged to direct pressure to the sides and end of the mandrel, thereby forcing around the mandrel *A*, the rubber compound, which is in sheet form, thus forming the jar. Fig. 1 is a sectional plan view, and shows the four side dies in position, while the cross-sectional view shows the sides of the jar already formed and the upper die for the top.

After the rubber compound is rolled into sheets of the correct thickness, it is cut into pieces approximately the size of the top and sides of the jar. These pieces are then placed on the mandrel

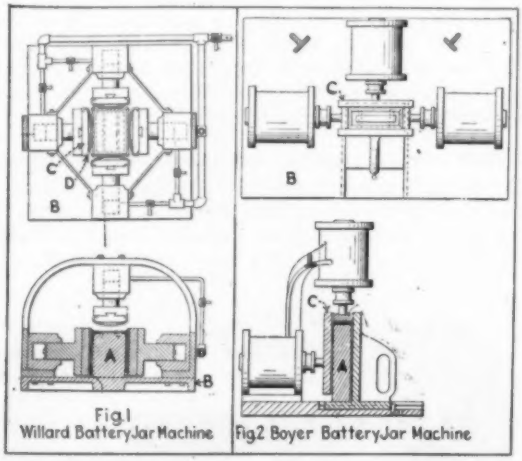


Fig.1 Willard Battery Jar Machine — Fig.2 Boyer Battery Jar Machine

A. The horizontal dies indicated by *C* are mechanically forced inwardly, compressing the rubber and forming the sides of the jar. The concave spring metal face *D* of each die comes in contact with the rubber first at the middle, then works out to the edges. As the metal face *D* flattens out, it gradually forces out the air between the rubber sheet and the mandrel *A*. At the same time the surplus rubber is brought to the end of the sheet, where it is squeezed together with the rubber from the adjoining sheet, thus forming the corners. The operation of squeezing the ends together eliminates all seams or joints. When the sides are formed, the top die is lowered to form the end of the jar.—Theodore A. Willard, Cleveland, Ohio. United States patent No. 1,352,160.

Patent No. 1,352,161 issued to Theodore A. Willard, of Cleveland, Ohio, covers the process of forming hard rubber storage battery jars with the apparatus described above, covered by patent No. 1,352,160.

BOYER'S MACHINE

Another patent has been issued which covers a method of making battery jars similar to the one mentioned in the foregoing paragraphs. The drawings in Fig. 2 give a concise idea how the jars are made. Plastic uncured rubber, previously rolled to the required thickness and cut to size, is wrapped around the metal core *A*, which is the size of the inside dimensions of the battery jar, except a little longer. As soon as the operator has placed the rubber around the core it is placed in the pressing

machine *B*. Heavy pressure is simultaneously applied to all four sides of the core and to the top, closing all joints and seams. The vertical pressing faces *C* are operated automatically. The plunger for the end of the jar is operated by hand and locked into position. Air pressure of 100 pounds is used. The pressing faces *C* are automatically released and the core with the formed jar is placed in a vulcanizer and cured.—Harry L. Boyer, assignor to Joseph Stokes Rubber Co., both of Trenton, New Jersey. United States patent No. 1,352,170.

OTHER MACHINERY PATENTS

THE UNITED STATES

NO. 1,357,217 Rubber mixer. D. R. Bowen and C. F. Schnuck, assignors to Farrel Foundry & Machine Co.—all of Ansonia, Conn. (Original application divided.)
1,357,899 Tire-cutting machine. C. Rasmussen, assignor of ½ to R. T. Ingalls—both of Racine, Wis.
1,357,948 Rubber mixer. D. R. Bowen, Ansonia, and C. F. Schnuck, New Haven, assignors to Farrel Foundry & Machine Co., Ansonia—all in Conn.
1,357,967 Multiplex circular loom for weaving multiply tubular fabric. M. P. Du Pray, Trenton, N. J.
1,357,984 Electrical repair vulcanizer. S. J. Hurwitz, Youngstown, O.
1,358,068 Repair vulcanizer for boots and shoes. H. D. Ferguson, Dowagiac, Mich.
1,358,094 Tire-fabric loom element. H. I. Morris, assignor to The Savage Tire Co.—both of San Diego, Calif.
1,358,120 Mold for vulcanizing tires in repairing. C. L. Smith and E. S. Webster, assignors by mesne assignments to Smith One Heat System—all of South Bend, Ind.
1,358,124 Apparatus and method for making rubber tubes. H. R. Stratford, Cleveland, O.
1,358,289 Apparatus for forming hollow articles of rubber. F. A. Cigol, Paterson, N. J.
1,358,614 Machine for producing textures rubber-coated on both sides. Albert Boecler, Malmö, Sweden.
1,358,702 Rubber mixer. D. R. Bowen, Ansonia, and C. F. Schnuck, New Haven, assignors to Farrel Foundry & Machine Co., Ansonia—all in Conn.
1,358,729 Tipping form for tire repair. T. L. Harkins, Boston, Mass.
1,358,770 Tire repair vulcanizing machine. A. W. Meyers, Milwaukee, Wis.
1,358,820 Vulcanizing mold. A. J. Brown, Union, N. J., assignor to G. & J. Tire Co., Indianapolis, Ind.
1,358,888 Tire retreading mold. J. H. Smith, San Francisco, Calif.
1,358,903 Mold and process for shaping battery jars. H. Weida, Highland Park, assignor to India Rubber Co., New Brunswick—both in N. J.
1,358,941 Collapsible tire core. H. A. Denmire, assignor of ½ to The General Tire & Rubber Co.—both of Akron, O.
1,359,072 Machine for trimming rubber mats. W. J. Kent, Brooklyn, N. Y., assignor to The Mechanical Rubber Co., a New Jersey corporation.
1,359,487 Tire repair vulcanizing press. G. W. Bulley, St. Joseph, Mich.
1,359,489 Machine for molding plastic articles. E. R. Claussen, Hartford, Conn.
1,359,562 Repair vulcanizer. N. M. Anderson, Worthington, Ind., assignor by mesne assignments to T. Bemis, Sr. and Jr., and R. Bemis, trustees of Anderson Steam Vulcanizer Co., a real trust.
1,359,632 Machine for making cord tires. K. O. B. Textorius, New York City, assignor of 1/3 each to T. A. Liebler, Riverside, Conn., and Eli Cahn, New York City.
1,359,779 Device for making tires. P. I. Anderson, Des Moines, Ia. (Original application divided.)
1,360,059 Sectional boot tree. W. C. Troche, Akron, O., assignor to The B. F. Goodrich Co., New York City.
1,360,310 Apparatus for filling tires with resilient compound. Z. Olsson, Toomsboro, Ga.
1,360,736 Clamp for tire cores. E. A. Ericson, Akron, O.
1,360,962 Portable repair vulcanizer. W. Frost, assignor to Harvey Frost & Co., Limited—both of London, England.
1,360,982 Repair vulcanizing apparatus. H. R. Auld, assignor to T. L. Harkins—both of Boston, Mass.

REISSUES

14,994 Tire stripper. G. E. Blaylock, assignor to The G. E. Blaylock Tire & Rubber Co.—both of Baltimore, Md. (Original No. 1,320,728, dated November 4, 1919.)

THE UNITED KINGDOM

147,508 Collapsible cores for manufacturing tires. P. and B. de Mattia, Clifton, New Jersey, U. S. A. (Not yet accepted.)
147,509 Collapsible cores for manufacturing tires. P. and B. de Mattia, Clifton, New Jersey, U. S. A. (Not yet accepted.)
147,960 Rubber mixing machine. F. H. Banbury, Ansonia, Conn., U. S. A.
148,045 Machine for stripping tires. W. H. Phipps, 57 Wick Road, and W. T. Hooper, 71 Repton Road, Brislington, Bristol.
148,077 Device for vulcanizing tire covers. E. Hopkinson, 1790 Broadway, New York City, U. S. A.
148,268 Apparatus for manufacture of pneumatic tires. T. Sloper, Southgate, Devizes, Wiltshire.

THE DOMINION OF CANADA

205,327 Attachment for rubber mixing mills. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of H. A. Weldon, Detroit, Mich., U. S. A.
205,347 Bead-forming ring for molding pneumatic tires. The Howe Rubber Corporation, assignee of John Schmidt, both of New Brunswick, New Jersey, U. S. A.
205,703 Mold for battery jars. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of H. Weida, Highland Park, New Jersey, U. S. A.
205,712 Apparatus and method for asbestos gasket manufacture. The Goodyear Tire & Rubber Co., assignee of E. A. Nall, executrix of Edward Nall, deceased—all of Akron, Ohio, U. S. A.
205,819 Clamp for vulcanizing machines. O. T. De Long, Atlanta, Ga., U. S. A.
205,906 Tire tube deflating machine. M. C. Schweinert, New York City, U. S. A.
206,022 Mold for retreading tires. A. C. Davidson, Lacombe, Alta.

GERMANY

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

754,130 (November 3, 1919.) Vulcanizing apparatus. Fleming & Co. G. m. b. H., Charlottenburg.
754,141 (June 19, 1920.) Automatic comb-cutting machine. Fritz Scholz, Naumburg a. S.
754,183 (September 8, 1920.) Tire repair apparatus. Hans Schmückert, Molkenmarkt 19, Brandenburg a. H.
754,721 (September 8, 1920.) Hose repair apparatus. Hans Schmückert, Molkenmarkt 19, Brandenburg a. H.

PROCESS PATENTS

THE UNITED STATES

NO. 1,357,379 Manufacture of storage-battery separators. H. L. Boyer, assignor to Joseph Stokes Rubber Co.—both of Trenton, N. J.
1,357,779 Construction of doll head, using as mold for shaping fabric face, soft rubber applied to a die. L. R. Kampes, Atlantic City, N. J.
1,357,784 Manufacture of connected blow-out patches from worn pneumatic tires. B. J. Levin, New York City.
1,358,957 Producing composite rubber and fabric cycle saddle tops. J. Jelley, Coventry, and H. Jelley, Birmingham—both in England.
1,359,075 Manufacture of tire valves. H. P. Kraft, Ridgewood, N. J.
1,359,919 Manufacture of hard rubber combs, etc. J. Reardon, Bloomingdale, assignor to American Hard Rubber Co., New York City—both in N. Y.
1,360,486 Heating crude rubber in inert, non-oxidizing atmosphere. J. V. Worthington and A. W. T. Hyde, assignors to The Dunlop Rubber Co., Limited—all of Regents Park, London, England.
1,360,702 Weaving fabric from rubberized yarn. C. Zeglen, Cleveland, O.

THE UNITED KINGDOM

147,387 Joining ends of inner tubes. Fuller's United Electric Works, Limited, Woodland Works, Grove Road, Chadwell Heath, Essex, and P. J. Hawkins, 67 King Edward Road, Walthamstow, London.
147,910 Manufacture of leather substitutes from used tires. A. Korn, 6 rue de Bretagne, Levallois, Seine, France. (Not yet accepted.)
148,327 Finishing tire fabrics. Ohligser Leinen- und Baumwollweberie P. de Weerth, 5 Marktstrasse, Ohligs, Germany. (Not yet accepted.)

THE DOMINION OF CANADA

205,640 Applying outer tire members to worn casings. C. C. Gates, Denver, Colo., U. S. A.

"JEM" RUBBER REPAIR AND CEMENT

"Jem" rubber repair for tires and tubes includes a can of rubber compound and one of solvent to be used as a cement. Applied cold, it is said to be self-vulcanizing and the makers guarantee a repair to last the life of the tire.—Amazon Rubber Co., 244 North Fifteenth street, Philadelphia, Pennsylvania.

"KEYS KUMFORT" HOSE SUPPORTER

A new kind of hose supporter for children which has recently been patented by a California woman, consists of a very short skeleton waist of cotton material, bound around the edges, with two strips of elastic webbing across the back and two more stitched to the lower edges of the waist beneath the arm-holes on each side, to form a triangular support for the stocking supporters attached. The garment acts as a shoulder brace and gives easily when stooping. It is very comfortable to wear because the pull of the stockings is distributed evenly on the wide shoulder band instead of on a narrow strap which would tend to cut and bind. The garment slips on over the head and has no buttons or pins to become loose.—Mrs. Hattie Keys, 717½ South Crocker street, Los Angeles, California. Canadian patent No. 201,795.

New Goods and Specialties

"PNEUMATIC" BATHING CAP

A new and comfortable waterproof bathing cap that does not stretch to fit the head is held in place by pneumatic pressure. An air-cushion band is attached inside the rim and may be inflated to head size, holding the cap on easily and securing a flexible adjustment entirely controllable at all times. The crown of the cap may be worn as loosely as desired, permitting any arrangement of the hair, and avoiding headache caused by pressure as in ordinary tight-fitting rubber bathing caps. The hair does not get wet as no moisture can possibly leak in past the firmly fitting air cushion band. The "Pneumatic" bathing cap is good-looking and stays firmly on the head.—The Pneumatic Bathing Cap Co., 14 East Jackson Boulevard, Chicago, Illinois.

"Pneumatic" Bathing Cap

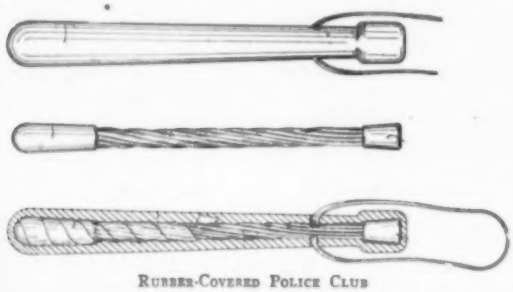
A PIONEER PNEUMATIC CORD TRUCK TIRE

Among the pneumatic cord truck tires that have attracted favorable attention is the General, claimed to be the pioneer in its line. Cord tires are generally claimed to be resilient to the greatest possible degree, and therefore do not eat up the car's power through friction in the tires themselves, as each cord is insulated in its own coating of rubber. General cord truck tires are built of specially compounded stock on the best cord fabric, with wear-resisting treads, and are claimed to have a record of 12,000 miles on the original tread.—The General Tire & Rubber Co., Akron, Ohio.

General Cord Truck Tire

A NORWEGIAN POLICE CLUB, RUBBER-COVERED

A humane police club which, according to the inventor, will "disable the antagonist at one stroke without thereby damaging him," comprises a core of wire rope with ferrules at each end, covered with rubber. At the handle end the club is provided with a carrying knot which is threaded through the wire rope core. This unique but practical weapon has been adopted by the police departments of Christiania, Norway, and Copenhagen, Denmark, and all-wood clubs have been discarded. It is the invention of a Norwegian policeman, Emil Evensen Welflen, and has been patented by him. United States and Canadian patents are for sale by Anthon Berg, Christiania, Norway.



Rubber-Covered Police Club

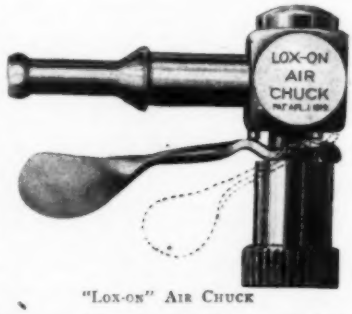
DETACHABLE FASTENER FOR HATS

The "Tight-On" hat elastic is a patented and clever variation of an old idea. It obviates sewing on elastics, can be attached in a moment to any hat, and will not pull out under any strain of high winds. It consists of a length of elastic with double pins on each end that are to be pierced through the hat and then spread apart. The elastic is adjustable in length by means of a slide. The "Tight-On" hat elastic is made in black or white and is adapted to children's hats or sports hats. It is a boon to the woman who wears her hair bobbed.—Marcus & Smith, 376-380 Lafayette street, New York City.

"Tight-On" Hat Elastic

A CONVENIENT TIRE ACCESSORY

The "Lox-on" air chuck, shown in the accompanying illustration, is intended for use on compressors in inflating tires. It contains a rubber cylinder that fits loosely over the valve, but grips it tightly when the lever is turned on, preventing any escape of air. The check-valve cannot be smashed by jamming, and the metal baffle-plate prevents jamming over the valve shoulder, protecting the valve. All parts are standardized and interchangeable.—Automatic Tire Valve Corporation, 1755 Broadway, New York.



"Lox-on" Air Chuck

PHONOGRAPH MOTOR WITH RUBBER WHEEL

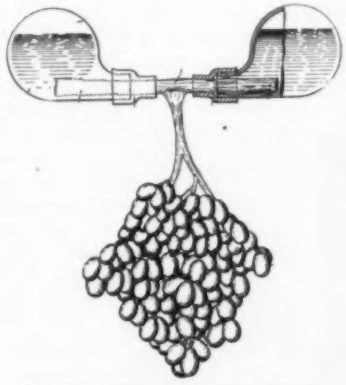
A phonograph motor has been devised which has a wheel of sponge rubber to revolve the turn-table. Any convenient electric light socket furnishes the power, connection being made by a cord of the desired length. There is an inside automatic switch which controls the current and stops the motor when the record is finished. The sponge rubber wheel permits the turn-table to revolve smoothly and evenly, keeping up any rhythm desired for dancing, and doing away with the annoyance of interrupting some choice musical selection to wind up the motor. The "Simplicity" motor is not large and conspicuous. It is finished in nickel and black enamel and is practically dustproof and "foolproof" as there are no exposed parts to get out of order. It attaches easily to any make of phono-

"Simplicity" Phonograph Motor

graph. All that is required for installing the motor is to remove the crank handle and let the spring motor of the phonograph run down.—Shelton Electric Co., 16 East 42d street, New York City.

WATER VESSEL FOR KEEPING FRUIT AND VEGETABLES

A novel water-containing vessel for preserving fruits and vegetables in a fresh state has recently been patented in the United States by an Argentinian. The device consists of a glass bobbin containing water, fitted with a rubber socket which fits closely over the stem of the fruit and prevents evaporation of the water which penetrates into the stem of the fruit as needed to preserve its freshness. This invention is particularly applicable to choice bunches of grapes, which can be kept in perfect condition for many months by fitting bobbins with rubber sockets to both ends of the vineshoot. The grapes are then suspended in a natural position and all the water in the bobbins is maintained above the stem to be absorbed by the fruit as necessary.—Luis Robichon, Mendoza, Argentina. United States Patent No. 1,360,024.



WATER VESSEL WITH RUBBER SOCKET

A RUBBER-CUSHIONED HAMMER

A new use for rubber is found in its application to a hammer handle, thereby firmly holding the head to the handle without wedges. A red rubber gasket is fitted over the handle and the hammer head forced on over it. Its present use is largely in rehandling hammers and sledges, but the inventor says that several hammer manufacturers are considering placing it in their manufactured product. Like the rubber tire, the rubber gasket makes these hammers resilient and tends to lessen shock to the user, thus conserving the workman's strength. He can use a lighter hammer, also, and attain equal efficiency, while he does not have to carry any "extra" hammer to meet the emergency of the hammer head flying off. The cushioned hammer, therefore, acts as a safety appliance, preventing accidents to workmen, in addition to its other advantages.—H. S. Isham, Belmar, New Jersey.

RUBBER-CUSHIONED HAMMER

A CORRUGATED INNER TUBE

By a special patented process, the "NoCeem" inner tube is made of red rubber in a mold which gives it an annular shape and corrugates that portion of the exterior surface which contacts with the tire casing. The compound used is said to contain a much higher percentage of actual rubber than generally used for inner tubes. The size, in both millimeters and inches, is molded on the surface immediately at the valve, for convenience, and the valve itself is seated on a specially reinforced fabric and rubber insert, properly and integrally vulcanized. The corrugations prevent the tube from sticking to the casing and its shape makes it practically impossible to exhaust the interior air, thereby minimizing the tendency to stick together or be pinched by the rim.—NoCeem Rubber Corporation, Harrison, New Jersey.

"NOCEEM" INNER TUBE

PENCIL ERASER EASILY ATTACHED

An invention which every pencil user will welcome is a practical rubber tip called the "Wedge" eraser, because of its peculiar shape. When an attached eraser is desirable it is readily slipped on and will stay on. The "Wedge" will erase large areas readily without smudging. It equals a "rubber finger" for turning pages and keeps the pencil from falling out of the pocket. Its pyramidal sides keep the pencil from rolling off the desk and its weight and shape keep the point upright if dropped. It is made of the best quality soft red rubber and is claimed to outwear three pencils.—Joseph Dixon Crucible Co., Jersey City, New Jersey.

"WEDGE" PENCIL ERASER

COMFORT IN TELEPHONING

A pneumatic receiver pad is one of the new conveniences for use with the telephone. It is made ring-shaped of soft rubber to fit over the hard rubber receiver, and encloses sufficient air to permit the receiver to be pressed closely to the ear, thus excluding all outside sounds and aiding conversation in a noisy office.—The Davol Rubber Co., Providence, Rhode Island.

PNEUMATIC RECEIVER PAD

"EVER-READY" FOLDING SHAVING BRUSH

A novel convenience for travelers is a shaving brush that fits compactly into its handle, thus keeping the brush absolutely safe from contamination and also protecting other contents of a traveling bag from contact with a wet brush. The bristles are a mixture of best quality badger hair and are vulcanized in hard rubber. This well-known feature of high-grade brushes does away with the annoyance of loose bristles, as once set in the rubber it is impossible for them to come out, no matter how long the brush is in use. To use the brush, the hinged cover is opened and closed again and the end of the brush fitted into the opening. The handle is made with patented, reversible, self-locking ferrule and when folded and packed ready for traveling

"EVER-READY" FOLDING SHAVING BRUSH

becomes a ventilated compartment which permits the wet brush to dry. All metal parts are built of heavy brass, highly nickeled.—American Safety Razor Corporation, Jay and Johnson streets, Brooklyn, New York.

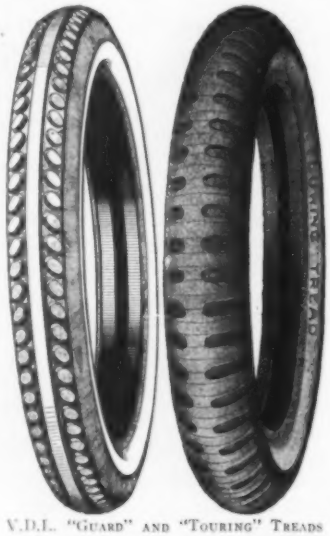
A NEW TYPE OF RUBBER HEEL

Rubber heels that wear down on one side in the same manner as leather heels will have to look to their laurels, if the makers of the newer type revolving rubber heels speak true. The Rogers revolving rubber "Duplex" heel is made on a principle generally in use in Europe but little known on this side of the water. As shown in the illustration a disk of rubber is sunk below the level of the heel. This revolves in use, all parts receiving the wear alike, and it absolutely cannot "run down." Slipping is claimed to be reduced to a minimum and maximum wear is attained, as the heel is discarded only when worn thin and flat all over.—The Rogers Rubber Co., Inc., Century Building, Pittsburgh, Pennsylvania.

ROGERS 'CAVITY REVOLVING "DUPLEX" HEEL

CANADIAN TIRE DESIGNS

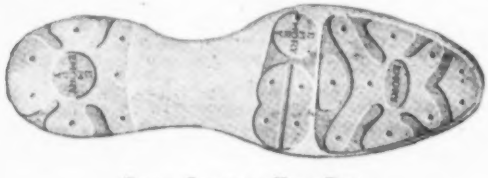
Two new designs of the Canadian "V. D. L." tires are the distinctive "Guard" and "Touring" tread casings, designed to meet various highway conditions. "V. D. L." tires are all Canadian in manufacture and are backed by Canadian capital. They are claimed by the maker to be the result of the experience of some of the foremost tire engineers on the North American continent. They are hand-made to meet Canadian road conditions and give great mileage and more comfort, being supersize.—Van der Linde Rubber Co., Limited, 142 Western Road, Toronto, Ontario, Canada.



V.D.L. "GUARD" AND "TOURING" TREADS

AN AMERICAN SOLE AND HEEL PAD SET

The Emory rubber sole pad is a patented device, made in two parts, to be attached to the leather half-sole of a shoe, the principle being the same as that of the rubber heel. This sole is made in two pieces in order to give greater service, as a whole half-sole of rubber is likely to crack at the point of bending. It is not heating to the feet, and it cushions the shoe, making walking easy by absorbing shocks. It is non-skid, which is a big asset in wet weather. Emory rubber heels are designed to conform to the sole, are as near non-skid as possible, and are made of springy live rubber.—The Emory Rubber Sole Co., 705-706 Board of Trade Building, Norfolk, Virginia.



EMORY SOLE AND HEEL PADS

RED SHORT BOOTS FOR SERVICE

Rubber boots that are built like tires for miles of hard wear are the product of a rubber manufacturer whose tires are guaranteed for a long mileage. Hood "Red" boots are built for service and every place where hard wear can attack a rubber boot has been made the subject of special study with the idea of fortifying these places to resist the hard usage. The heavy gray rubber molded heels and eight-ply soles are "tough on rocks" and are joined by the Hood tire process to the high-grade red uppers. The soles run all the way under the heels and cannot come apart; they are claimed to give better mileage than the soles of the average boot without cracking. An extra thick vamp and heavy duck lining add materially to the life of the boot, which is cured under heavy pressure. Hood "Red" boots have light-colored foxing and look just as well as they wear.—Hood Rubber Products Co., Inc., Watertown, Massachusetts.

HEAVY DUCK LINING
ENTIRE BOOT CURED UNDER HEAVY PRESSURE
4 PLY TOP
5 PLIES HERE FOR EXTRA WEAR
EXTRA REINFORCEMENT TO WITHSTAND WEAR
SIX PLIES HERE RELIEVES STRAIN
DOUBLE SOLE RUNS ALL THE WAY UNDER HEEL
MOULDED HEEL TOUGH ON ROCKS
HEAVY CLOTH INSOLE
HEAVY RUBBER SOLE TOUGH ON ROCKS
8 PLY SOLE

HOOD SHORT RED RUBBER BOOT

A DUAL TREAD CORD TIRE

A distinct dual tread cord tire which is the result of five years of experiment and research work is the "Wiregrip" tire. The makers assert that in this new tire is embodied the duel vacuum tread. Skid blocks extending across the carcass of the tire diagonally permit the carcass to flex freely in any desired direction. The cross section is built wide and low, distributing the flex of the tire from bead to bead. It is said to develop remarkable ease of riding and in fast driving to show a marked tendency to hug the road.—The Lancaster Tire & Rubber Co., Columbus, Ohio.

LANCASTER "WIREGRIP" CORD

VALVE CAPS BOXED IN SETS

Recognizing a need in the tire world, a manufacturer of tire valves is putting out sets of five caps in small metal boxes. Valve caps were found missing from 1309 Broadway automobile valve-stems in a recent survey.—A. Schrader's Sons, Inc., 783 Atlantic avenue, Brooklyn, New York.

The Problem of Gutta Percha Cultivation Solved

MORE than twenty years ago gutta percha was successfully extracted from the leaves of the *Palaquium* or gutta percha tree. The product, however, was very soft and usually of a greenish color. It was not particularly valuable and what promised to be a valuable process was therefore abandoned. Taking a hint from the mechanical extraction of rubber from dried shrubs and vines, experiments were undertaken by Dr. Tromp de Haas in the Government Botanical Gardens in Java. Dried leaves were used and the process is so far successful that the gutta percha is now extracted in commercial quantities at a profit. The fact that leaves from young plants in the nursery, as well as leaves from mature trees may be used, greatly increases the available supply and indeed makes gutta percha cultivation on a large scale possible. The history of the leaf extraction experiments that follows is extremely interesting.

Extracting gutta percha from the leaves of gutta-yielding trees was first accomplished by Rigole[1] in 1892. He used carbon bisulphide as a solvent on finely ground green leaves. In 1896 Serullas[1] obtained a patent[2] for a process in which hot toluol was used for extraction, and the solution precipitated with acetone. Rosin oil was sometimes used instead of acetone but with indifferent success.

GUTTA PERCHA NURSERY

The method named after Obach[1] is based on the solubility of gutta in petroleum ether at boiling point and the capacity to precipitate when cooling at 15 degrees.

All of the above produced a soft inferior product, and experimenters turned to mechanical extraction as the only solution.

Mechanical extractors embody grinding mechanisms for pulverizing the leaves, rolls for agglutinating, sieves and water for separating the woody matters from the gum. Guayule and grass rubber extraction machines[1] such as the Abbé pebble mill, the De La Corte crusher, the Bridge crusher, the Guiget crusher and the Valour crusher may all be adapted to this sort of work. There are in use today two systems of mechanical extraction in the Dutch East Indies, the Ledeboer, and the Tromp de Haas.

The advantage of the mechanical process over the chemical is that much more material can be handled at one time, making the exploitation of an estate easier. The Ledeboer method is employed with success by the Nederlandsche Getah Perchafabriek, Singapore. Natives collect the leaves in the forest and bring them to the factory where the gutta is extracted. Since the natives are anxious to bring in as large a quantity of leaves as possible, they do not scruple to mix any kind of leaves with those from true gutta-yielding trees.

The Tromp de Haas system is in vogue at the Experiment Station at Tjipetir, Java, where the government has large gutta plantations. Among the advantages of collecting leaves on a plantation as against collecting in a forest, is the obvious one—that coolies cannot mix valueless leaves with the useful ones.

So successful is the mechanical process that a second gutta percha plantation has already been started at Tjitarik, Preanger Regency, Java.

As for yields obtained by the mechanical process, it has been found that a 10-year-old tree gives 15 pounds of dry leaves per annum, from which is obtained 9 to 10 ounces of gutta percha. The annual production by this means at Tjipetir is given as follows: about 38 tons in 1914, 47 in 1915, 51 in 1916, 67 in 1917, and 68 in 1918.

While it was at first thought that the leaf gutta percha would be inferior to that obtained by tapping methods, the process has so far been improved that leaf gutta is now used for insulating submarine cables and many other purposes.

[1]Rubber Machinery. By H. C. Pearson. Pages 257-270.
[2]British patent No. 11,166, 1892.

TRADE-MARKED BRANDS OF BELTING, HOSE AND PACKING

Recent rubber products of interest include an oil-resisting packing, grain and ore-elevator beltings, and steam hose—all made by the same manufacturer.

"Volunteer" packing is a black, oil-resisting sheet packing, specially compounded for use in contact with oil.

"Kohinoor" elevator belt is made of a special heavy duck and high-grade friction rubber, the outstanding feature being the unique way in which the rubber cover is anchored to the body of the belt. This is done by the application of a layer of coarse meshed fabric known as "cider cloth" between the outside ply and the rubber cover. The rubber compound used for the cover is forced through the meshes of this cider cloth and thus anchored to the body of the belt. The cover cannot blister or peel off, thus making the "Kohinoor" an ore-elevator belt suitable for severest service.

"Grainvey" is a very strong, rubber-covered belting, made of closely woven, rubber-impregnated duck, especially for conveying grain horizontally or on an incline, troughing easily without spilling.

"Elevay" belting is made of heavy, woven duck, impregnated with rubber, and is intended especially for bucket elevators and wherever extra strength is required.—The Diamond Rubber Co., Akron, Ohio.

WAR DEPARTMENT SPECIFICATIONS FOR MECHANICAL RUBBER GOODS—IV[1]

WAR DEPARTMENT SPECIFICATIONS No. 333-1-1, frequently referred to in the following specifications, were published in THE INDIA RUBBER WORLD January 1, 1920.

LABORATORY TUBING

War Department Specification, No. 333-1-15—June 5, 1919

(AUTHORITY OF SUPPLY CIRCULAR No. 8, P. S. & T. DIV., JANUARY 24, 1919)

GENERAL.—(*a*) This specification covers the requirements for compounded and pure-gum tubing for use in chemical laboratories.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) Dimensions as follows:

Compounded		Pure Gum	
I. D.	Wall Thickness	I. D.	Wall Thickness
Inch	Inch	Inch	Inch
1/ 8	1/32	1/ 8	1/32
3/16	1/16	3/16	3/64
1/ 4	1/16	1/ 4	1/16
1/ 4	1/ 8	3/ 8	5/64
....	....	1/ 2	3/32

(*b*) Lengths of the compounded tubing to be as specified; that of pure gum will be in 12½-foot lengths.

(*c*) Method of manufacture shall be optional with manufacturer provided a tubing of the quality desired is produced.

BRANDING.—No branding required.

MATERIAL.—See General Specifications.

(*a*) Compounded tubing shall contain not less than 40 per cent of fine Pará rubber; remainder to consist of such ingredients as will insure good aging qualities and service.

(*b*) Pure-gum tubing shall contain not less than 92 per cent fine Pará, not more than 5 per cent sulphur. Remainder of the compound shall consist of such ingredients as will insure good aging qualities and service. The use of reclaimed rubber is not permitted.

INSPECTION.—See General Specifications.

(*a*) Inspector may cut at random a 4-foot section from each lot of 1,000 feet or less.

TESTS.—See General Specifications and following table.

(*a*) Test specimens shall be ¼ by 1 inch at constricted part.

TABLE

	Tensile Minimum Pounds	Ultimate Elongation, Minimum Inches	Set Stretch for 10 Minutes Inches	Per Cent Set After 10 Minute Rest, Maximum
Compounded	1,300	1–5½	1–4½	25
Pure gum.....	1,300	1–8	1–7	12

CLOTH INSERTION TUBING

War Department Specification, No. 333-1-16—June 5, 1919

(AUTHORITY OF SUPPLY CIRCULAR No. 8. P. S. & T. DIV., JANUARY 24, 1919)

GENERAL.—(*a*) This specification covers the requirements for C. I. tubing for general use.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

DIMENSIONS.—(*a*) See the following table.

BRANDING.—See See General Specifications.

(*a*) Use letters "C. I."

MATERIAL.—See General Specifications.

(*a*) Fabric plies shall be of sheeting or a plain weave fabric weighing not less than 4¼ ounces per square yard.

INSPECTION.—See General Specifications.

TESTS.—See General Specifications and following table.

TABLE

Size		1/8-Inch	3/16-Inch	1/4-Inch
Fabric, plies, minimum.....		2	3	4
Thickness:				
Tube, minimum	*inch*	3/64	3/64	3/64
Cover, minimum	*inch*	1/64	1/32	1/32
Ultimate elongation, tube and cover, minimum	*inches*	2–6	2–6	2–6
Tensile:				
Tube, minimum	*pounds*	500	500	500
Cover, minimum	*pounds*	450	450	450

WHITE MACHINE RUBBER TUBING

War Department Specification, No. 333-1-17—June 5, 1919

(AUTHORITY OF SUPPLY CIRCULAR No. 8. P. S. & T. DIV., JANUARY 24, 1919)

GENERAL.—(*a*) This specification covers the requirements for tubing for general use.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) Dimensions shall be as follows:

I. D.	Wall Thickness
¼-inch	1/16-inch
⅜-inch	5/64-inch
½-inch	3/32-inch
¾-inch	1/ 8-inch
1-inch	1/ 8-inch
1½-inches	3/16-inch

BRANDING.—Not required.

MATERIAL.—See General Specifications.

(*a*) Tubing shall be white.

INSPECTION.—See General Specifications.

(*a*) Inspector may cut at random a 3-foot section from each lot of 1,000 feet or less.

TESTS.—See General Specifications and following table.

(*a*) Test specimens to be ¼ by 1 inch at the constricted part.

TABLE

Tensile, minimum	*pounds*	900
Ultimate elongation, minimum.....	*inches*	1–5
Set:		
Stretch for 10 minutes.....	*inches*	1–4
Per cent set after 10-minute rest.....	*maximum*	25

RUBBER TIPS FOR FLEXIBLE METALLIC HOSE

War Department Specification, No. 335-1-1—June 5, 1919

(AUTHORITY OF SUPPLY CIRCULAR No. 8. P. S. & T. DIV., JANUARY 24, 1919)

GENERAL.—(*a*) This specification covers the requirements for molded tips to be used with metallic hose in airplanes, etc.

(*b*) See War Department Specification No. 333-1-1, headed General Specification for Mechanical Rubber Goods[2], which is made a part hereof, except in such cases as the provisions below directly conflict. In such cases the word and meaning of this specification will govern.

CONSTRUCTION.—See General Specifications.

(*a*) Size and shape, together with metal tips, as specified in proposal.

BRANDING.—See General Specifications.

MATERIAL.—See General Specifications.

INSPECTION.—See General Specifications.

(*a*) Manufacturer shall furnish inspector with eight strips for test purposes, as specified in the General Specifications, for each shipment.

TESTS.—See General Specifications and following table.

TABLE

Tensile, minimum	*pounds*	800
Ultimate elongation:		
Maximum	*inches*	2–9
Minimum	*inches*	2–5

BUMPERS

War Department Specification, No. 335-1-3—June 5, 1919

(AUTHORITY OF SUPPLY CIRCULAR No. 8. P. S. & T. DIV., JANUARY 24, 1919)

GENERAL.—(*a*) This specification covers the requirements for automobile bumpers.

(*b*) See General Specifications for Mechanical Rubber Goods[2] which are a part hereof.

CONSTRUCTION.—See General Specifications.

(*a*) Size and shape as specified in proposal.

BRANDING.—See General Specifications.

(*a*) Shall be molded with the words "U. S. A. Bumper," manufacturer's name, and date. Any other branding shall be specified in proposal.

MATERIALS.—See General Specifications.

INSPECTION.—See General Specifications.

(*a*) Inspector shall select 3 pieces at random from each and every shipment of 1,000 pieces or less.

TESTS.—See General Specifications and following table.

(*a*) Test pieces shall be cut from bumpers and buffed to a thickness of approximately ⅛-inch.

TABLE

Tensile, minimum	*pounds*	800
Elongation, minimum	*inches*	2–5
Ultimate, maximum	*inches*	2–9

[1] Continued from THE INDIA RUBBER WORLD, September 1, 1920, pages 805-808.

[2] See THE INDIA RUBBER WORLD, January 1, 1920, page 214.

The Obituary Record

PRESIDENT OF THE BOSTON RUBBER SHOE CO.

COLONEL HARRY E. CONVERSE, president of the Boston Rubber Shoe Co., Malden, Massachusetts, and for many years one of the prominent figures in the American rubber trade, died of heart failure at his country estate, "The Moorings," in Marion, Massachusetts, December 8, aged 57. He had been in failing health for more than a year.

COLONEL HARRY E. CONVERSE

Colonel Converse was born in Malden in 1863, the son of the late Elisha Slade Converse, founder of the Boston Rubber Shoe Co., first mayor of Malden and popularly regarded as Malden's "grand old man." Following his education in the public schools and in the Chauncy Hall School, of Boston, he entered his father's employ as office boy in 1882 and soon procured a lumper's job. After two years he was called into the office, where he successively filled several responsible positions, being appointed assistant general manager in 1894 and general manager the following year. On the death of his father he was elected president and a director of the company.

In 1899 Colonel Converse was made a director of the United States Rubber Co., succeeding George A. Lewis, resigned, and also became a director of the Bay State Rubber Co., Boston Rubber Co., American Rubber Co., Revere Rubber Co., Glendale Elastic Fabric Co., and Rubber Manufacturers' Mutual Insurance Co.

He was also identified with numerous other business interests, having been a director of the Cotton & Woolen Manufacturers' Insurance Co. of New England, Industrial Mutual Insurance Co., Broadway Storage Co., East Boston Dry Dock Co., Metropolitan Storage Warehouse Co., Touraine Confectionery Co., Glenark Knitting Co., Export Lumber Co., and the First National Bank of Malden. He was trustee of the Malden Hospital, Malden Savings Bank, the Soldiers Home in Chelsea and the estate of Elisha Slade Converse.

Prominent in public life as well, he served two years in the Malden city council, was for several years fire commissioner of that city, a quartermaster in the state militia, and as a member of the staff of Governor Wolcott, with the rank of colonel, went to the front during the Spanish-American war. His public spirit was further shown by building the Malden Auditorium and its annex in order to give that city high-class amusements.

Yachting was his favorite diversion in leisure hours and he became one of the most prominent yachtsmen in the East, being a member of the New York, Larchmont, Eastern, Boston and Beverly Yacht Clubs. At "The Moorings," his 65-acre estate overlooking Buzzards Bay, a place of much hospitality in past years, a wireless telegraph system kept him in constant touch with his several yachts when they were in surrounding waters.

Colonel Converse was a thirty-second degree Mason and a member of numerous associations and clubs, including The Rubber Association of America, Chamber of Commerce of the United States of America, Boston Chamber of Commerce, Home Market Club, Real Estate Exchange of Boston, Boston Athletic Association, Brookline Country Club, Boston Art Club, and the Algonquin and Exchange Clubs of Boston.

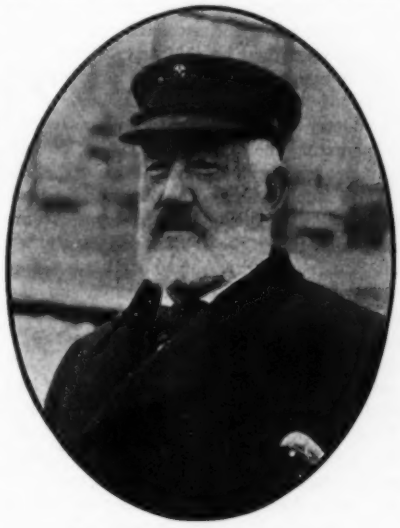
He is survived by his widow, Mary Caroline (Parker) Converse; two sisters, Mrs. Costello C. Converse and Mrs. Lester Leland, both of Boston; three sons, Parker Converse, Roger Wolcott Converse, and Elisha Edmands Converse of California; and two daughters, Mrs. Margaret Butler of Chicago, and Mrs. Mary Essick of Oregon.

The funeral took place at the Converse homestead in Malden. Interment was in the family lot at Woodland Cemetery that city.

Colonel Converse was a type of the 100 per cent American, a worthy successor of his honored father, trusted and respected by his business associates, beloved by all who knew him. His untimely death comes as a distinct shock to the rubber trade, by which his passing will be generally mourned.

FORMER DIRECTOR OF THE UNITED STATES RUBBER CO.

Commodore Elias Cornelius Benedict, banker, broker, rubber planter and yachtsman, whose death, late in November, was briefly noted in the December issue of THE INDIA RUBBER WORLD, was for some three score years one of the most picturesque outstanding figures of the American financial world, and long prominently identified with the rubber industry.



COMMODORE E. C. BENEDICT

Born in Somers, New York, January 24, 1834, the son of the late Rev. Henry Benedict and Mary Betts Lockwood Benedict, he received his education in the schools of Westport, Connecticut, and Buffalo, New York, where he spent part of his youth. When 15 years old he became clerk in the Wall street office of Corning & Co. In 1857 he succeeded to this business and organized the firm of Benedict & Co., in 1863 becoming a member of the New York Stock Exchange. In 1871, Roswell P. Flower, later Governor of New York, joined Commodore Benedict and the name of the firm was changed to Benedict, Flower & Co. This continued for four years, when Commodore Benedict organized the present firm of E. C. Benedict & Co.

He played an important part in the early financial life of New York City, and with his brother organized the Gold Exchange Bank, which grew out of the gold speculation of the 60's and 70's. He specialized in gas stocks and was for some time president of the Commercial Acetylene Co., vice-president of the Indianapolis Gas Co., president of the Greenwich Construction Co., and for many years a director of the United States Rubber Co., and its subsidiary the General Rubber Co., until he resigned in 1914.

Ever a hearty believer in outdoor sports for the business man, his particular hobby was yachting. He owned several large steam yachts at various times in which he cruised to all parts of the world, and, as Commodore of the New York Yacht Club and

Yachting Commissioner of the State of Connecticut for several years, became one of the world's most famous yachtsmen.

In 1913, with the "Atreus," formerly the property of John Hays Hammond, he was the first private yacht owner to steer his vessel through the Panama Canal. In his best known yacht, the "Oneida," he cruised more than 275,000 miles, making it practically his home during the latter years of his life. His love of fishing and other sports won the firm friendship of former President Grover Cleveland, Rear Admiral "Bob" Evans and Thomas Jefferson, the actor, with whom his name has requently been associated, and all of whom he outlived. It was on the "Oneida," July 1, 1893, while cruising slowly up the East River, New York City, that President Cleveland underwent the now famous secret operation whereby his entire left upper jaw was removed because of a malignant growth, an artificial rubber jaw being subsequently fitted. And it was with the "Oneida" in 1915 that he rescued the crew and eleven passengers from the wrecked sloop "Southern Cross" and towed the sloop to the Leeward Islands, for which he was officially thanked by the British Government.

Commodore Benedict's yachting hobby served his business interests to an eminent degree, however. It was his habit to spend his winters cruising in southern waters, and his connection with the rubber industry led to numerous trips of investigation to the rubber country of South America during the period when crude rubber demand overtook supply. In the winter of 1904-5 his steam yacht "Virginia" with a party of New York rubber men was the second vessel to carry the American flag up the Amazon, which he ascended for a thousand miles. From the facts unearthed by this and several subsequent trips, together with his experiences as prime mover in the Moju Rubber Plantations and Development Co. near Pará on the Moju River, a tributary of the Amazon, he foresaw the hopelessness of greatly increasing the Amazonian rubber output, and his investigations were largely instrumental in the early interest of the United States Rubber Co., in the plantation rubber industry of the Far East. One of his most prized possessions was a $5,000 gold cup, presented by the United States Rubber Co., commemorating his first trip up the Amazon. It was Commodore Benedict who established wireless telegraphy on the Amazon for commercial purposes, it having been found impossible to establish ordinary telegraph systems in the forests.

When in 1917, owing to failing health, Commodore Benedict retired from the firm of E. C. Benedict & Co., of which he had been the senior partner for sixty years, he was the third oldest member of the New York Stock Exchange in the order of admission. That year he donated a $500,000 hospital to Greenwich, Connecticut, and completed the conversion of his extensive and beautiful estate at Indian Harbor, near Greenwich, into a model bird sanctuary on plans laid down by the Greenwich Bird Protective Association, an organization of prominent residents of that town. It was at his Indian Harbor home that he died quietly November 23, 1920, in his eighty-seventh year, following an illness of more than a year due to a complication of diseases incident to old age.

One of our great financiers, keen, progressive and enthusiastic in business, jovial, witty and companionable in his leisure hours, a thorough sportsman, his death closes a notably active, eventful and useful life and will be regretted by those who enjoyed his acquaintance.

A MANUFACTURER OF TIRE FABRIC LOOMS

Lucius J. Knowles, president of the Crompton & Knowles Loom Works, Worcester, Massachusetts, died of influenza in London, England, November 26, 1920, while on a business trip.

Mr. Knowles was born in Worcester, Massachusetts, on April 6, 1879, the son of Francis B. and Hester A. Knowles. Following his graduation from Worcester Academy he took a course at Harvard University, graduating with the class of 1902. His business career began when he joined the Crompton & Knowles Loom Works, of which his father was one of the founders. In 1906 he was appointed treasurer; in 1911, vice-president, and in 1917, president. He was also president of the Reed-Prentice Co., of Worcester from 1914 to 1915.

He was a director in the Merchants' National Bank and the Bancroft Realty Co., a trustee of the Worcester City Real Estate Association, a trustee of Burnside Associates, and managing trustee of the Knowles Building, all of Worcester.

He is survived by his widow, one daughter, Sarah M. Knowles, and a son, Lucius J. Knowles, Jr.

PROMINENT IN THE CRUDE RUBBER TRADE

The death of F. C. J. Pusinelli at the age of 61 years, at Berne, Switzerland, on October 30, 1920, has removed one of the best-known international figures in the Pará rubber trade. Mr. Pusinelli became associated with the London firm of Heilbut, Symons & Co., in the early eighties and about 1884 he went to Brazil, where he founded the house of Pusinelli, Prusse & Co., the chief rubber exporting firm in Pará and with the London firm mentioned practically controlled the Pará rubber trade at that time.

F. C. J. PUSINELLI

He continued at the head of this company for ten years, serving also as German Consul and Austrian Vice-Consul for several years and for a time as a member of the Commercial Chamber of the State of Pará. In 1897 he returned to London to take a prominent place in the management of Heilbut, Symons & Co.

Mr. Pusinelli was prominent in the rubber trade of the United States through his continuous connection with the well-known New York firms, Reimers & Co., Poel & Arnold, Arnold & Zeiss, and Poel & Kelly.

F. C. J. Pusinelli was a man of unusual business ability and possessed of a broad and analytical mind. He was really a big man, yet modest and retiring in disposition. His genial presence will be greatly missed by his friends and colleagues in the trade.

MANUFACTURER OF RUBBER SUBSTITUTE

Dr. Louis A. Dreyfus, president, treasurer and general manager of the L. A. Dreyfus Co., Rosebank, Staten Island, New York, died suddenly December 1, 1920, while speaking at the inauguration of the municipal trolley service on Staten Island.

Born in Fremont, Ohio, in 1867, and educated in the public schools there, he graduated from the University of Michigan with the degree of Ph.C. in 1887, then studied at Heidelberg, Germany, and in 1891 received the degree of Ph.D. at the University of Zürich, Switzerland.

Returning to the United States he started his business career as an analytical chemist in Cleveland and later in Chicago, specializing in cold water paints, for which he was granted several patents. In 1902 he came to Staten Island as chemist for the Muralo Co., a large manufacturer of cold water paints which still uses his patents.

In 1909 Dr. Dreyfus organized the company which bears his name. From a small beginning the business grew until in 1917 it made necessary the erection of the large and modern rubber substitute factory at Rosebank.

THE BERLIN *Gummi-Zeitung* REPORTS THE DEATH IN VIENNA of Georg Schneider, senior partner of G. Schneider, Gummihof,

G.m.b.H, Vienna. He was formerly a partner of Metzeler & Co. in Munich, and first came to Vienna as representative of that firm. He was the first president of the Austrian Association of Surgical Rubber Goods Wholesale Dealers.

THE EDITOR'S BOOK TABLE

BAMBER'S RUBBER CACULATOR BOOK. MACLAREN & SONS, Limited, 37 Shoe Lane, London. Flexible leather, 4¾ by 6¼ inches, 65 pages.

THIS is a collection of data arranged in convenient pocket form for the use of works managers, superintendents, cost clerks, salesmen and others who require to ascertain weights of certain rubber goods for purposes of manufacture or quotation, in either English or metric units. Tables are furnished for washers, disks, gas tubing and solid cord, ranging in specific gravity from 1.00 to 2.00. These are duplicated in English and metric measures and cover the full range of sizes in the goods mentioned. Tables are included showing specific gravities and corresponding weights per cubic inch, and per cubic foot and cubic inches per pound. There is also included a table of equivalent times and temperatures for vulcanization for the adjustment of curing conditions. The work is prefaced in English, French, Italian and Spanish, with notations concerning the value and use of the tables. It is worthy of consideration as a practical help for busy rubber factory executives, salesmen and merchants.

THE TWENTY-NINTH ANNUAL EDITION OF HENDRICK'S COMmercial Register of the United States for Buyers and Sellers. S. E. Hendricks Co., Inc., 70 Fifth avenue, New York City. Cloth, 2572 + 164 pages, 7½ by 10 inches.

This annual register of producers, manufacturers, dealers and consumers which has just appeared for 1921, is indispensable as a buyers' reference for men of every industry and business activity. The rubber industry is well represented in machinery as well as in manufacturing. In order that the wealth of information contained in the volume shall be readily accessible, it is divided into sections, indicated in color on the edges of the leaves, namely: Index to Trades; Classified Trades Section; Trade Names Section; Alphabetical Section; Advertisers' Index. A Service Bureau is maintained free of charge by the publishers for the assistance of users of the register. In case one cannot find the information wished for, a request to the bureau will enlist its services to find the article or manufacturer required, and a reply will be promptly sent.

"EXPORT REGISTER OF THE FEDERATION OF BRITISH INDUStries." Industrial Publicity Service, Limited, London, 1920. Cloth, 312 pages, 7 by 9½ inches.

"The Export Register of the Federation of British Industries" is an epitome of all British industry, and is the first book of its class to give a comprehensive survey of this broad field and to be of real service to all who use or buy British goods throughout the world. It is divided by an industrial grouping system, with an elastic number of groups, of which Rubber, Asbestos, Leather and Allied Trades is an important member, with five subdivisions. Principal business houses are grouped under firm names and also listed under the names of their products in the index of manufactures and products. The Federation of British Industries was founded during the war and occupies a predominant place in British industry today.

NEW TRADE PUBLICATIONS

THE YEAR BOOK OF THE AMERICAN CHAMBER OF COMMERCE IN London (Inc.) for 1920 is an interesting compilation containing lists of officers, directors, committees and membership, together with the president's report for the year and the by-laws of the Chamber. The aims of the Chamber, which was organized in 1916, are to promote friendship and trade between the United States and Great Britain. In America it works closely with the Chamber of Commerce of the United States and the leading trade and financial organizations. In Great Britain the Chamber has established useful working relations with the British Government and the leading British commercial and industrial organizations. Among the associate members are several of the most important American manufacturers of the principal lines of rubber goods, such as footwear, tires, mechanicals, etc.

A MOST COMPLETE CATALOG OF HARDWARE AND PLUMBERS' RUBBER specialties has just been issued by the Lavelle Rubber Co., 413-421 North Franklin street, Chicago, Illinois. It is well printed, profusely illustrated, and describes everything in the line from anti-splashers to welding hose.

AN ESTEEMED BRITISH CONTEMPORARY, *The Financier*, LONDON, oldest among financial daily papers in that city, has recently published a 16-page pamphlet entitled "A Tax on Turnover." The solution set forth of the nation's fiscal problem, which is no less applicable to the affairs of the United States, was first advocated in England by *The Financier*, which believes it to be "the only safe and effective substitute for the excess profits duty which now cripples industry and trade, inflates prices, causes unemployment and is largely responsible for prevailing discontent."

INTERESTING LETTERS FROM OUR READERS

A BRIEF FOR OFFICIAL RUBBER FIGURES

TO THE EDITOR:

DEAR SIR: In analyzing the article in THE INDIA RUBBER WORLD, December 1, 1920, covering "The Rubber Surplus and its Relation to Future Tire Production," written by Richard Hoadley Tingley, my attention was drawn to Table 1, showing the world's production, consumption and surplus of rubber from 1912 to 1919, inclusive, and on comparing his "consumption" figures of 1912 to 1917 with the figures as compiled by the War Service Committee of the Rubber Industry of the U. S. A., I am unable to reconcile them, and would request further information that will explain these differences satisfactorily.

If you will refer to the second chart of the memorandum prepared by the War Service Committee, and particularly to the lower half of the chart which covers "World's Consumption," you will note that the figures given on United States consumption agree with the charted lines accurately, but when you compare the figures of the consumption of the "Rest of the World" with the drawn chart you will find that the figures are only shown for Great Britain, France, Germany and Italy, and no figures are recorded for "The Rest of the World" as shown on the chart in pink color. For instance, take the year 1916, the chart shows a consumption for the rest of the world of approximately 85,000 tons, while the figures beside the chart are as follows:

Great Britain	26,760
France	14,685
Germany	3,000
Italy	8,552
Total world	52,997

Note that the chart differs from the figures by 85,000 tons—52,997, or approximately 32,013 tons, which apparently is consumption by the rest of the world outside of other countries enumerated, and if this is true, then Mr. Tingley's figures are wrong, as his consumption figures as shown on Table 1, only take the aggregate of the United States, Great Britain, Germany, France and Italy, leaving out the balance of the world, which would be made up of Russia, Japan, Holland, Denmark, Sweden, etc.

In other words, Mr. Tingley's figures on the world's consumption differ from the War Service Chart as follows:

Year	War Service Committee Charts, in Tons: U. S. A.	Rest of World	Total	Mr. Tingley's Figures as Per Table No. 1	Difference
1912	52,964	45,000	97,964	95,863	2,101
1913	52,179	56,000	108,179	102,455	5,724
1914	61,251	59,000	120,251	99,800	20,451
1915	96,792	61,000	157,792	135,214	22,578
1916	116,477	85,000	201,477	169,474	32,003
1917	177,088	80,000	257,088	229,017	28,071
	.....	.....	942,751	831,823	110,928

Above figures show an additional 110,928 tons consumed in six years, which apparently Mr. Tingley has not taken into consideration, or else the War Service Committee intend to show this as surplus in place of consumption. If Mr. Tingley has omitted this quantity, then his figures of 224,000 tons world's surplus at the end of 1919, should be nearer 112,000 tons.

I have a further criticism to make and that is in the *Trade News Service* figures of 165,000 tons consumed for the first nine months of this year compared with the War Service Committee consumption figures, as shown on Table 2, of 236,977 tons for the full year of 1919 in the United States, when from reports received from other sources the belief is that the production of tires, etc., for the first nine months of this year was greater than 1919, yet the figures of the *Trade News Service* would have us believe that less rubber was consumed on a greater production of rubber goods.

If the production of rubber tires and goods was as great for the first nine months of 1920 as they were for 1919, then it is obvious that if 1919 figures of rubber consumption are correct the United States consumed as much in nine months as in the previous twelve or nearer 236,000 tons instead of 165,000 tons.

Bear in mind that I do not constitute myself as an authority on the rubber supply and demand of the world, but I do believe that the figures as given in Mr. Tingley's article of December require further explanation.

It is certainly to be regretted that the rubber importers and manufacturers are leaving this important matter in the form of a guess, and if supply has anything to do with demand, and simple economics prove it has, then it is exceedingly difficult to hazard a forecast of prices for the next twelve months at least.

If the reason of the importers and manufacturers is as Mr. Tingley states, "that the individual holdings are a private matter to be kept a trade secret," then why cannot the Rubber Association educate the rubber companies to the importance of obtaining authentic figures that can be depended on, giving them assurance that no individual holdings will be open to a competitor, but that all figures be sent to an impartial party such as Babson Statistical Organization, who would be under bond not to disclose any figures but the totals of all the industries using rubber in the manufacture of goods?

C. D. McKINNON,
The Goodyear Tire & Rubber Co. of Canada, Limited.

Toronto, Ontario, Canada.

RUBBERIZED DICE

TO THE EDITOR:

DEAR SIR:—

I read an article of yours not long ago in which you stated that every line of work and sport today found rubber necessary in some form. Now, down here shooting craps is a pretty generally popular sport. We don't use rubber in it, either. Seems like your statement was a trifle broad.

El Paso, Texas. W. G. S.

We cannot agree with the writer in his conclusions for they are erroneous. In proof we cite one of the several advertisements found in a prominent sporting paper:

RUBBERIZED FRICTION DICE
The Latest Creation in Transparent Dice Work, Either Missouts or Passers, $5.00 per Pair, Why Pay More? Rubberizing Liquid, Best Made, $6.00 per Bottle.

As to the wisdom of using magic liquids in his locality, that is a question.—The Editor.

JUDICIAL DECISIONS

THE B. F. GOODRICH RUBBER CO. VS. PARSHELSKY BROS.

Where plaintiff, after cancellation of a contract between it and another providing for delivery of tires to defendant, by mistake delivered such tires, plaintiff is entitled to the return of the tires, or to recover from defendant their value, notwithstanding, had the tires been delivered pursuant to contract, defendant would not have been liable.—New York Supplement Reporter, Volume 183, page 30.

U. S. RUBBER CO. VS. SILVERSTEIN.

In an action on a guaranty in writing, which was ambiguous on the question whether it guaranteed sales to two sons of the guarantor or one, evidence held to sustain a finding that it was a guaranty as to both sons.

Whether letter: "Inclosed find check for the three above bills. Please do not send my statements and my son's statements together. Send him his, and me mine. They do business for themselves, and therefore send them separate statements, but I am good for what they buy"—was a guaranty of sales to two sons of defendant, or only one, in accordance with a prior oral agreement, held for the jury.—Northeastern Reporter, Volume 128, page 123.

FAIR VS. HARTFORD RUBBER WORKS.

Under Workmen's Compensation Act (Gen. St. 1918, §§5351, 5352) employe, who had previously lost sight of left eye, and was hit in the right eye, so that he was rendered totally and permanently blind, held entitled to award for total permanent incapacity under section 5351, *i. e.*, to a weekly compensation of one-half his weekly earnings at the time of the injury for 520 weeks.—Atlantic Reporter, Volume 111, page 193.

IN RE U. S. RUBBER CO.

Under Trade-Mark Act, 5 (Comp. St. §9490), denying registration to any mark consisting of insignia of the United States, no trade-mark having the letters "U. S." as its most prominent feature can be registered.—Federal Reporter, Volume 265, page 1016.

METALLIC RUBBER TIRE CO. VS. HARTFORD RUBBER WORKS CO. United States District Court, Connecticut.

Where infringement by defendant after termination of its license was willful and deliberate, it is liable for all profits made, and cannot require complainant to accept the royalty fixed by the license contract.

Where infringement was willful and deliberate, and it contested recovery in the courts for 12 years, complainant held entitled to interest from the date of the decision of the Circuit Court of Appeals, holding the patent valid and infringed, except for the time the matter of accounting was held for decision by the master after close of the evidence before him.—Federal Reporter, Volume 266, page 543.

ADJUDICATED PATENTS

I. T. S. RUBBER CO. VS. UNITED STATES LACE & BRAID MANUFACTURING CO. United States District Court, Rhode Island.

The Tufford reissue patent, No. 14,049, for a resilient heel lift having its body portion of concavo-convex form on every line of cross-section, should be construed with reference to form and function of the structure shown. As so construed claims 5, 6 and 7 held not anticipated, valid, and infringed.—Federal Reporter, volume 266, page 375.

Activities of The Rubber Association of America

ANNUAL MEETING

THE SIXTH ANNUAL MEETING of The Rubber Association will be held in the Astor gallery of the Waldorf-Astoria, New York City, on Monday, January 10, 1921, at 2.30 p. m. Matters of great importance to the Association will be discussed, and a large attendance is expected.

ANNUAL DINNER

The twenty-first annual dinner of The Rubber Association of America will be held in the grand ball room of the Waldorf-Astoria at 7 p. m. Firm members, affiliated members, associate members and those in their employ are eligible to attend and may invite guests, no limitation being placed to on the sale of tickets. The seating will be at round tables accommodating ten persons. Members who desire entire tables or who wish to sit together, but do not require an entire table, will so state when ordering tickets, the price of which is eight dollars.

NOMINEES FOR ELECTION TO THE BOARD OF DIRECTORS

NEW YORK, December 7, 1920.

To firm members:

The terms of the following named directors of The Rubber Association expire with the annual meeting in January, 1921: F. A. Seiberling, H. T. Dunn, C. J. Davol, W. J. Kelly, C. W. McLaughlin.

The Constitution and By-Laws of the Association provide that the Nominating Committee shall submit to firm members, at least thirty days in advance of the annual meeting, the names of nominees selected by that committee, to be voted upon at the annual meeting for election to the Board of Directors for a term of three years, viz.: January, 1921—January, 1924.

In accordance with the provisions of the Constitution and By-Laws, your Committee on Nominations herewith submits the names of ten firm representatives of firm members of the Association as nominees, five of whom are to be elected at the annual meeting on January 10, 1921; F. A. Seiberling, president, The Goodyear Tire & Rubber Co.; H. T. Dunn, president, The Fisk Rubber Co.; John J. Watson, Jr., president, Lee Tire & Rubber Co.; F. H. Jones, treasurer, Tyer Rubber Co.; W. O'Neil, vice-president, The General Tire & Rubber Co.; J. W. Thomas, vice-president, Firestone Tire & Rubber Co.; Tracy S. Lewis, president, Beacon Falls Rubber Shoe Co., Horace De Lisser, chairman Board of Directors, Ajax Rubber Co., Inc.; J. H. Kelly, vice-president, Hewitt Rubber Co.; F. R. Henderson, F. R. Henderson & Co.

It should be noted that as a result of the policy determined upon by the Board of Directors there are submitted the names of ten firm representatives (which is twice the number of vacancies in the Board of Directors) in order that there may be opportunity for selection.

Attention is directed to the fact that five of the major branches of the rubber industry are represented by the list of ten nominees, to wit: tires, mechanical goods, sundries, footwear and crude rubber, and it is suggested that in determining upon the nominees for whom their votes will be cast at the annual meeting, firm members give consideration to the desirability of electing a representative of each of the branches of the industry referred to.

The vote at the annual meeting will be conducted by the use of regular ballots which will be distributed at the proper time.

B. G. Work, F. C. Hood,
H. S. Firestone, H. C. Pearson,
G. B. Hodgman, Committee on Nominations.

A. L. VILES, General Manager.

VOTING AND PROXIES—SUGGESTED REVISION OF THE CONSTITUTION

NEW YORK, December 7, 1920.

To firm and affiliated members:

Under the provisions of the Constitution and By-Laws of the Association each firm member is entitled to a vote at the annual meeting, to be cast by the registered firm representative only, unless his power is delegated to some one in the employ of or acting for the firm member and holding a written proxy.

The Constitution and By-Laws of the Association provides that affiliated members may not vote for the election of directors nor upon questions which relate solely to the rubber industry itself. On all other matters each affiliated member is entitled to a vote, to be cast by its registered firm representative only, unless his power is delegated to some one in the employ of or acting for the affiliated member and holding a written proxy.

In view of the fact that at the annual meeting on January 10, balloting for the election of directors will be necessary because ten firm representatives have been nominated by the Committee on Nominations to fill five vacancies in the board, the use of a signed proxy in the event of the inability of any firm representative to attend becomes a more important matter than heretofore. It is hoped that our members will bear this in mind and will be certain to make use of the enclosed proxy, if necessary, delegating authority to the general manager of the Association or to some other representative to vote for them in the event of their inability to be present.

An important change in the Constitution and By-Laws, involving Section 2 of Article XI, concerning the annual dues, is proposed, with the approval of the Board of Directors of the Association, to be voted upon at the annual meeting. The suggested substitute and the present Section 2 are shown on the attached memorandum, for the purpose of comparison.

The effect of the proposed modification of this section relating to annual dues is to require manufacturing firm members, as a condition to their holding membership, to agree to contribute to the income of the Association on the basis of a pro-rata fee of a specified number of cents per 100 pounds of crude rubber purchased by them, in addition to the annual basic membership fee and the initiation fee now in effect. In other words, it is proposed to make permanent, as a part of the By-Laws, the equitable basis which has been in effect for the past two years under an arrangement for the voluntary contribution of the fee by manufacturing firm members. The exact amount of and method of collection of the fee is to be under the control of the association membership and subject to change at the regular annual or a special meeting of the Association.

It is believed that the proposed change is justified by the equitable and satisfactory operation of the plan which it is now desired to establish on a permanent basis by making the fee a part of the regular membership dues of manufacturing firm members.

A. L. VILES, General Manager.

SUGGESTED AMENDMENTS OF ARTICLE XI, SECTION 2, OF THE CONSTITUTION AND BY-LAWS

PRESENT

Article XI. Section 2

ANNUAL DUES. The annual dues for the firm members shall be fifty dollars ($50) per annum, for affiliated members twenty-five dollars ($25) per annum, and for associate members five dollars ($5) per annum payable in advance. All dues for members shall become payable on January 1 in each year. Members elected after January 1 in each year shall pay a proportion of the annual dues for the balance of that year beginning with the first of the month following election. Members who fail to pay their entrance fees, annual dues, or other indebtedness within thirty days after the same become due, shall be notified by the treasurer, and if payment is not made within the next succeeding thirty days, shall be reported to the Executive Committee as in arrears, and may, at the discretion of the Executive Committee, be dropped from the membership rolls.

PROPOSED

Article XI. Section 2

ANNUAL DUES. The annual dues for affiliated members shall be twenty-five dollars ($25) per annum and for associate mem-

bers five dollars ($5) per annum payable in advance on January 1 in each year. The annual dues for firm members shall include a basic fee of fifty dollars ($50) per annum payable in advance on January 1 in each year and for all manufacturing firm members an additional pro rata annual fee based upon the amount of crude rubber purchased by each of such members. The rate upon which such pro rata fee shall be based for each year or any portion thereof and the time and method of payment of such fee shall be determined by the Association at its annual meeting or at any special meeting duly called for that purpose. Members elected after January 1 in each year shall pay a proportion of the annual dues for the balance of that year beginning with the first of the month following election. Members who fail to pay their entrance fees, annual dues or other indebtedness within thirty days after the same become due, shall be notified by the treasurer, and if payment is not made within the next succeeding thirty days, shall be reported to the Executive Committee as in arrears, and may, at the discretion of the Executive Committee, be dropped from the membership rolls.

ASSOCIATION NOTES

For convenience in accounting, membership in the Association will be for the calendar year instead of the year from the first of the month following the date of election. To make this rule effective January 1, 1921, bills rendered will be for an amount which represents that portion of the membership dues earned during 1920; thus, if a membership account is due on April 1, bill will be rendered for an amount which represents the proportion which nine months bears to one year, or $37.50. Accounts due at other times during the year will be billed proportionately, so that on January 1, 1921, all membership accounts may be billed for the full membership dues for one year from that date.

The proposal of Secretary Houston, of the Treasury Department, for a revision of the excise tax should not disturb tire manufacturers at this time, for the Tax Committee of the Association is closely in touch with the situation.

The Rubber Association will contribute $10,000 to the support of the Highway & Highway Transport Education Committee, with the understanding, however, that it is to cover the year 1921 and that the Association is not obligated to any greater extent than that.

The following members were elected November 30, 1920: Firm member, Raymond Rubber Co., R. N. Agnew, firm representative, Titusville, New Jersey. Associate members: P. Lawrence Munch, Hood Rubber Co., Watertown, Massachusetts; Fred B. Peterson, Chas. T. Wilson Co., Inc., 59 Pine street, New York.

NEW YORK HIGHWAY TRANSPORTATION SHOW

The New York Highway Transportation Show will be held under the auspices of the Motor Truck Association of America, Inc., in the Twelfth Regiment Armory, 62nd street and Columbus avenue, and the First Field Artillery Armory, 68th street and Broadway, New York City, from January 3 to 8, inclusive, the week preceding the New York Automobile Show. The show will be conducted by motor truck people for motor truck users, and not only to sell motor trucks and accessories, but to educate the public in the economic advantages of motor truck transport and to demonstrate the necessity for a national highway system.

The leading motor trucks and commercial vehicles will be on exhibit, together with trailers and accessories, including tires. There will be numerous educational exhibits, and a continuous tableau depicting the evolution of transportation in all lands; also model truck terminals and traffic control.

The program will be as follows: Monday, "Opening Day"; Tuesday, "Army Day"; Wednesday, "Motor Accident Prevention Day"; Thursday, "Highway Transportation Day"; Friday, "Farmers' Day"; Saturday, "Motor Truck Association Day." There will be prize contests, educational addresses by transportation authorities, and motion pictures showing the advantages of motor trucks, the abuses of pneumatic and solid tires, and the methods of overcoming such abuses. A slow-moving section of one film shows what happens to the tires, springs, frame, body and load when a truck traveling at high speed hits an obstruction and rebounds on the level road.

GOOD ROADS CONGRESS AND SHOW AT CHICAGO

The American Road Builders' Association, which includes in its membership the highway and street officials, engineers and contractors, together with the manufacturers of road machinery, materials and transportation equipment throughout the United States and Canada, will hold its Eighteenth Annual Convention, Eleventh American Good Roads Congress, and Twelfth National Good Roads Show at the Coliseum, Chicago, February 9 to 12.

More than 40,000 square feet of floor space will be devoted to the exhibits which many manufacturers of road materials, road building machinery and highway transportation equipment are preparing to send. A large attendance is assured, including government, state and municipal authorities, together with road, automotive and chemical engineers, contractors, agriculturists, motorists and large users of trucks, tractors and other highway transportation equipment.

INVOICE FORMS STANDARDIZED

After two years of intensive work in cooperation with associations, trade papers and leading business houses, a standard form of invoices has been adopted by the National Association of Purchasing Agents that will avoid the need of private forms, the use of rubber stamps to provide special spaces, and will greatly simplify the work of purchasing agents and auditors. The basic size is 8½ by 7 inches, the same as the standardized voucher, to facilitate filing together, and the same width as the standardized 8½ by 3½ inch check. The invoice may, however, be from 7 to 14 inches from top to bottom, anything over 7 inches being folded back on a dotted or ruled line for filing. The paper stock used is 17 by 22 or 17 by 28 and a tolerance of ⅛-inch is allowed so that invoices when padded can be trimmed.

STANDARD OCEAN BILL OF LADING NEEDED

Owing to the great losses and hardships which have been incurred by its members engaged in import trade, through improper handling of merchandise by steamship companies, the National Association of Waste Material Dealers, Inc., has taken the initiative in a movement looking toward standardization of ocean bills of lading which promises to gain the support of trade organizations throughout the country.

A circular letter issued by the association includes numerous extracts from ocean bills of lading to show the arbitrary attitude of many steamship lines which ignore the rights of shipper and consignee, and points out the need of a standard bill of lading comparable to that used by the railroads, also congressional action to frame harbor laws equitable to all parties concerned.

Harbor laws are favored that clearly set forth the duties of ocean carriers, consignees and local carriers in connection with loading, unloading, segregating and removing goods from the pier. The obligation of the carrier to deliver in good condition the identical goods received is specially emphasized because the average merchant draws and accepts drafts with an ocean bill of lading as security. It is recognized that varying port conditions in certain countries or in certain harbors may render one uniform ocean bill of lading impracticable and that several standard forms may be necessary.

It would seem that in the long run steamship companies as well as merchants would benefit by a clean-cut code of procedure avoiding the misunderstandings, shortages and litigation bound to follow in the wake of present methods.

News of the American Rubber Industry

FINANCIAL NOTES

TO CONSERVE its cash resources The Fisk Rubber Co., Chicopee Falls, Massachusetts, has passed the quarterly dividend of 75 cents a share on common stock, due January 1, 1921, although it has been more than earned during the past year. The regular quarterly dividend of 1¾ per cent on the first preferred stock has been declared payable February 1 to stockholders of record January 21, 1921.

The financial position of the company is sound, with quick assets in the ratio of two to one to liabilities. Sales for the twelve months ended December 21 were approximately $42,000,000 against $43,600,000 in 1919, the company's biggest year. While inventories are larger than normal, finished tires consist of standard salable sizes, mostly four-inch and under. At the end of the year stocks of cotton fabric, rubber and other materials are to be marked down to sound values, the readjustment being effected out of 1920 earnings without drawing on the previously accumulated surplus. Spring business to date is reported fully up to that of last year, being little affected by the present condition of the automobile industry, as less than 25 per cent of total sales are for original equipment.

Sales of The Mason Tire & Rubber Co., Kent, Ohio, for its fiscal year ended October 31, were $6,598,000.00, being 95 per cent greater than last year. Net earnings, after heavy charge offs, to reduce inventories and raw materials from original cost to present market values, amounted to $524,000.00, being 135 per cent increase over the preceding year. Comparative sales and earnings for the past four years are as follows:

Year	Sales	Earnings
1917	$1,200,000.	$104,457.60
1918	2,324,000.	203,406.47
1919	3,468,000.	223,705.52
1920	6,598,000.	524,742.73

The Mason company does not have a pound of high-priced fabric or rubber on undelivered contracts, and its inventories of finished tires in stock at factory and its twenty-two branches are less than normal. Sales, which gradually declined until October, have since gone steadily upward, and January sales will almost be normal.

The report of the Firestone Tire & Rubber Co. for the last fiscal year shows total sales of $114,980,260 compared with $91,078,514 for the preceding year, an increase of 26 per cent. The report states that the high peak of production was reached in April when the daily average was 28,000 tires. Net earnings were $9,396,912. The company set aside $8,151,750 for depreciation of inventory. Total current assets exclusive of investments in other companies and in securities, as well as investments in land, machinery and equipment, were $73,732,502. Total assets were $107,404,200, against which there were total current liabilities of $32,684,569.

The financial statement of the Boston Woven Hose & Rubber Company as of August 31, 1920, disclosed total assets of $10,448,348 contrasted with $7,340,409 the same time a year ago. Merchandise is carried at $4,926,299, against $2,675,255 last year; and cash and debts receivable contrast $2,506,938 with $1,809,192 in the previous year. Accounts and notes payable are placed at $3,336,352. compared with $1,460,026; and the surplus is reported at $2,161,996 against $2,030,383 in 1919.

Plans for $40,000,000 financing and the selection of a new board of directors for The Goodyear Tire & Rubber Co., Akron, Ohio, had virtually been completed when suit for receivership was filed in the Common Pleas Court at Columbus, Ohio, by Frank S. Monnett as a stockholder. This suit was subsequently dismissed by the court.

The directors of The McGraw Tire & Rubber Co., East Palestine, Ohio, in order to conserve cash resources have voted to omit the quarterly dividend on the preferred stock. This action was taken in view of the general trade and credit conditions throughout the country.

DIVIDENDS DECLARED

Company	Stock	Rate	Payable	Stock of Record
American Chicle Co.	Pfd.	1½% q.	Jan. 3	Dec. 18
Apsley Rubber Co.	Pfd.	3½% s.a.	Jan. 1	Dec. 27
Bergougnan Rubber Corporation.	Pfd.	1¾% q.		
Boston Woven Hose & Rubber Co.	Com.	$3 q.	Dec. 15	Dec. 1
Boston Woven Hose & Rubber Co.	Pfd.	$3 s.a.	Dec. 15	Dec. 1
Brunswick-Balke-Collender Co.	Pfd.	1¾% q.	Jan. 1	Dec. 20
Canadian Consolidated Rubber Co., Ltd.	Pfd.	1¾% q.	Dec. 31	Dec. 22
Dayton Rubber Manufacturing Co.	Com.	1¾% q.	Jan. 1	Dec. 15
Delion Tire & Rubber Co.	Pfd.	2% q.	Jan. 1	Dec. 24
du Pont, E. I., de Nemours & Co.	Com.	2% q.	Dec. 15	Nov. 30
du Pont, E. I., de Nemours & Co.	Com.	2½% stk.	Dec. 15	Nov. 30
du Pont, E. I., de Nemours & Co.	Deb.	1½%	Jan. 25	Jan. 10
Firestone Tire & Rubber Co.	Com.	6% a.	Dec. 30	.....
Habirshaw Electric Cable Co., Inc.	Com.	$0.37½		
Hood Rubber Products Co., Inc.	Pfd.	1¾% q.	Dec. 1	Nov. 20
Kelly-Springfield Tire Co.	6% Pfd.	$1.50 q.	Jan. 1	Dec. 17
Pennsylvania Rubber Co.	Com.	1½% q.	Dec. 31	Dec. 15
Pennsylvania Rubber Co.	Pfd.	1¾% q.	Dec. 31	Dec. 15
Salmon Falls Manufacturing Co.	Com.	2½% q.	Dec. 1	Nov. 15
United Shoe Machinery Corporation	Com.	$0.50 q.	Jan. 5	Dec. 20
United Shoe Machinery Corporation	Pfd.	$0.37½ q.	Jan. 5	Dec. 20

NEW YORK STOCK EXCHANGE QUOTATIONS

DECEMBER 23, 1920

	High	Low	Last
Ajax Rubber Co., Inc.	25½	24½	24½
The Fisk Rubber Co.	10⅜	10⅜	10⅜
The B. F. Goodrich Co.	33½	28	33½
The B. F. Goodrich Co., pfd.	70½	70	70½
Kelly-Springfield Tire Co.	32¾	29	32¾
Kelly-Springfield Tire Co., pfd.	..	..	..
Keystone T. & R. Co., Inc.	7¼	6¼	7
Lee R. & T. Corp.	17	16½	17
United States Rubber Co.	58½	53	58¼
United States Rubber Co., pfd.	98	97	97

CLEVELAND STOCK EXCHANGE QUOTATIONS

The following quotations on the Cleveland Stock Exchange, December 20, of stock of the principal rubber companies were supplied by Otis & Co., Cuyahoga Building, Cleveland, Ohio.

	Last Sale	Bid	Asked
Firestone T. & R. Co.	80	..	82
Firestone T. & R. Co., 1st pfd.	81¾	80	81¾
Firestone T. & R. Co., 2d pfd.	74	..	74
General T. & R. Co., pfd.	89	..	..
The B. F. Goodrich Co.	35¾	..	..
The B. F. Goodrich Co., pfd.	75½	..	75½
The Goodyear T. & R. Co.	26	21	22
The Goodyear T. & R. Co., pfd.	52½	45½	46
Kelly-Springfield T. & R. Co.	49	..	..
Kelly-Springfield T. & R. Co., pfd.	120	..	..
The Miller Rubber Co.	75	71	75
The Miller Rubber Co., pfd.	76	..	78
Portage Rubber Co.	20	17	22½
Portage Rubber Co., pfd.	49	..	50
Star Rubber Co.	350¾	..	..
Swinehart T. & R. Co.	39	..	..
Victor Rubber Co.	15	12	28

NEW INCORPORATIONS

A. C. G. Sales Co., Inc., December 13 (New York), $100,000. A. C. Geraci, Buffalo, New York; P. Lisi, McIntyre; J. Isgro, Punxsutawney—both in Pennsylvania. To sell tires.

Barker Insulation Co., Inc., December 8 (New York), $1,000. W. P. and J. H. Barker; C. A. Barner—all of 27 William street, New York City. To manufacture waterproof and insulated fabrics.

Burlock Non-Skid Tire Corp., The, November 29 (Delaware), $250,000. J. E. Burlock; C. E. Speigel; W. D. Beardsley—all of Nyack, New York. To manufacture tires.

Cigol-Behrens Rubber Mfg. Co., The, November 10 (New Jersey), $350,000. J. H. Behrens, president and treasurer; L. G. Davenport, secretary. Principal office, Lodi, Bergen County, New Jersey. To manufacture molded rubber goods, etc.

Collins Puncture Proof Tube Co., November 26 (New Jersey), $200,000. J. Kinzley, Jr.; W. B. Mackay, Jr.; J. W. Mercer—all of Hackensack, New Jersey. Principal office, Hackensack, New Jersey. To manufacture tires and tubes.

Dayton Rubber Mfg. Co., December 3 (Delaware), $200,000. C. T. Cohee; C. B. Outten; S. L. Mackey—all of Wilmington, Delaware. To manufacture rubber tires.

Dixie Tire & Rubber Association, November 12 (Delaware), $500,000. J. E. Mayo; J. D. Youngblood; R. T. Meadow—all of Dallas, Texas.

Eureka Tube Protector Co., November 8 (Maine), $200,000. G. H. Keyes, president; B. F. Carroll, treasurer—both of Boston, Mass.; J. F. Dana, Clerk, Portland, Maine. Principal office, Portland, Maine. To manufacture and sell automobile tube and tire protectors.

Hoffman Tire & Rubber Co., D. R., December 6 (Delaware), $400,000. M. M. Lucey; V. P. Lacey; L. S. Dorsey—all of Wilmington, Delaware.

Miamisburg Vulcanizing Co., The, July 30 (Ohio), $5,000. J. E. Kohl, president, Xenia; R. L. Eminger, vice-president, Miamisburg; C. L. Denis-ton, secretary, treasurer and general manager, Dayton—all in Ohio. Principal office, 129 North Main street, Miamisburg, Ohio. To sell solid and pneumatic tires, automobile accessories, etc.

Miller Rubber Co., R. E., December 3 (New York), $2,000,000. H. C. Hand; S. B. Howard; R. K. Thistle—all of New York. To manufacture tires, etc.

North American Process Co., Inc., December 3 (New York), $500. J. A. Wade; F. J. Eldred; H. C. Wilder—all of Malone, New York. Principal office, Malone, New York. To manufacture rubber products.

Northern Rubber Products Co., December 10 (Delaware), $500,000. T. L. Croteau; M. A. Bruce; S. E. Dill—all of Wilmington, Delaware. To manufacture tires, tubes, etc.

Old Hickory Tire Co., December 1 (New Jersey), $3,500,000. J. Q. Frey; J. D. Fischbeck; F. Child—all of 790 Broad street, Newark, New Jersey. Principal office, 790 Broad street, Newark, New Jersey. Agent in charge, F. Child. To manufacture rubber goods of all kinds.

Rotterdam Oversea Trading Corp., December 15 (New York), $25,000. V. E. Cartz; D. A. J. Kessler; H. A. S. Van Daalin, 97 Kenmore Place, Brooklyn, New York. To export and import sugar, rice and rubber.

Rubber Association of Canada, The, March 17 (Canada), without share capital. C. H. Carlisle, president; A. D. Thornton, vice-president; C. N. Candee, treasurer; J. Westren, assistant treasurer. Principal office, 808 Royal Bank Building, Toronto, Ontario, Canada.

Rubber Fusing Process Corp., November 15 (Delaware), $1,000,000. C. A. Cole, Hackensack; R. A. Van Voorhis, 77 Oak street, Jersey City—both in New Jersey; A. R. Oakley, Pearl River, New York. Principal office with the Registrar & Transfer Co., 900 Market street, Wilmington, Delaware.

S. & M. Tire Co., November 1 (Pennsylvania), $100,000. S. Broida, president; S. Edelstein, vice-president; G. A. Burchell, secretary and treasurer. Principal office, New Castle, Pennsylvania. To distribute tires, tubes and accessories.

Sona Corporation, December 3 (New York), $500. S. Mattison; C. P. Stewart; N. G. Wixon—all of 43 Exchange place, New York City. To manufacture waterproof paper and cloth.

Superior Tire Co., Inc., December 8 (New York), $2,000. N. Levy, 124 West 115th street, New York; B. E. Steineck, 1216 38th street, Brooklyn; B. Bass, 974 Freeman street, Bronx—all in New York.

Sure-Foot Heel & Rubber Co., The, September 1 (Pennsylvania), $150,000. O. J. McNitt, president; H. T. Weaver, vice-president; S. F. Snyder, secretary and treasurer; R. M. McKey, general manager. Principal office, Gettysburg, Pennsylvania. To manufacture rubber heels.

Surprise Ladies Garter Co., The, November 20 (New York), $25,000. J. Voskamp, 821 West 178th street; I. A. Lyons, 18 West 107th street; L. B. Boigas, 4 West 109th street—all in New York City. To manufacture garters, etc.

Two Seventeen Front Street Metal & Rubber Corp., December 8 (New York), $3,000. B. C. Ribman, 125 Prospect Park West; I. Ribman, 925 St. Marks avenue, both of Brooklyn; M. Moran, 15 East 184th street, Bronx—both in New York. To deal in waste materials.

Universal Gum Corp., November 8 (Delaware), $1,500,000. T. L. Croteau; M. A. Bruce; S. E. Dill—all of Wilmington, Delaware. Principal office with the Corporation Trust Company of America, duPont Building, Wilmington, Delaware.

Vulcanizing Machine & Supply Co., September 23 (Michigan), $25,000. M. Merrimam, president; H. S. Reynolds, vice-president; H. S. Blackman, secretary and treasurer; M. J. Hobin, sales manager. Principal office, Jackson, Michigan. To manufacture "Universal" vulcanizing machines.

Vulcweld Rubber Co., December 6 (Delaware), $1,000,000. M. M. Lucey; V. B. Lacey; L. S. Dorsey—all of Wilmington, Delaware. To manufacture tires.

BUSINESS STANDS FOR HIGHER ETHICS

Six formulas adaptable to business men who are now passing through the temporary process of readjustment and contraction were recommended by Thomas W. Lamont, member of the banking house of J. P. Morgan & Co., in the following statement read at a convention last week:

"We are all feeling the discomfort of this process. No one can foretell the duration of this process or estimate accurately its immediate and final results. Necessarily this period of uncertainty renders it most difficult in business to make today decisions that have a bearing upon the long future. Fixed formulas of conduct, policy and future engagements are hard to write. There are, however, some things every man engaged in active business can do:

"We can resolve not to be frightened into panic by the wolf that may not come.

"We can meet our contracts to the utmost limits of our resources.

"We can take our losses like good sportsmen.

"We can unfailingly be fair to our clients and customers.

"We can adhere just as rigidly as ever to good ethics and fair business practice.

"We must be just to our fellow workers and employes and consider their welfare as an integral part of our own."

Mr. Lamont expressed the opinion that, fundamentally, in the way of business, there is not very much wrong with America.

NEW YORK CONFERENCE OF MOTOR AND ACCESSORY ADVERTISING MEN

"How Advertising Can Turn the Tide in the Automotive Industry" will be considered at the meeting of the Advertising Managers' Council of the Motor and Accessory Manufacturers' Association to be held at the Hotel Astor, New York, on Friday, January 7, 1921. E. C. Tibbetts, advertising manager of The B. F. Goodrich Co., Akron, Ohio, who has been chairman of the Council and its Executive Committee from its inauguration last March, will preside at the meeting.

A comprehensive program has been arranged, including an open-forum discussion on "My Best Advertising Bet for 1921," which will be an exchange of ideas and experiences on increasing the efficiency of the advertising dollar. "Selling the Automotive Industry to America—The Spirit of Transportation," will be the title of a paper by E. W. Clark, advertising manager of the Clark Equipment Co., Buchanan, Michigan. Alfred Reeves, general manager of the National Automobile Chamber of Commerce, will discuss "The Outlook for the Automotive Industry in 1921—Cooperation Between the Advertising Managers of the Car Manufacturers and the Parts and Unit Makers." "A Review and Forecast of Business," with particular reference to the automotive industry, will be presented, with detailed statistical charts, by C. C. Parlin, manager of the commercial research department of the Curtis Publishing Co., Philadelphia.

A novel feature will be an exhibit of members' advertising. The various advertising executives have been invited to mount on suitable frames specimens of their significant and particularly interesting advertising material, including campaign layouts, posters, dealer-helps, broadsides, and booklets.

Plans for the meeting have been formulated by a committee, consisting of E. C. Tibbetts, advertising manager, The B. F. Goodrich Co., Akron, Ohio (chairman); S. E. Baldwin, advertising manager, Willard Storage Battery Co., Cleveland, Ohio; E. W. Clark, advertising manager, Clark Equipment Co., Buchanan, Michigan; J. C. McQuiston, manager, department of publicity, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania; W. C. Huff, advertising manager, Detroit Pressed Steel Co., Detroit, Michigan; and M. Lincoln Schuster, Motor and Accessory Manufacturers' Association, New York City.

WINTER MEETINGS OF THE SOCIETY OF AUTOMOTIVE ENGINEERS

The annual meeting of the Society of Automotive Engineers will be held in the Engineering Societies Building, 29 West 39th street, New York City, January 11, 12 and 13, 1921. Recognizing that automotive engineers must accept the responsibility of increasing the sales appeal of automotive products by effecting economies in their design and manufacture which will justify price reduction, the program for the several sessions is being planned in a larger and more comprehensive way than ever before, and a large attendance is anticipated.

Tuesday, January 11, will be devoted to the standards meeting, with an aeronautic session in the evening.

Wednesday, January 12, there will be the annual business meeting, at which the engineer's place in the industry will be defined, followed in the afternoon by simultaneous body engineering, aeronautic and chassis sessions. In the evening will occur "The Carnival" of music and dancing.

Thursday, January 13, will be devoted to fuel and highway sessions, the latter dealing chiefly with the effect of heavy automotive vehicles on highway surfaces. The annual dinner will occur in the Hotel Astor at 7 p. m.

The Chicago meeting of the S. A. E., to be held at the Hotel Morrison, February 2, 1921, will be devoted chiefly to truck design, followed by a dinner in the evening.

The Columbus meeting, to be held at the Hotel Deshler, February 10, 1921, will be devoted to farm power engineering and tractor design, with a dinner in the evening.

TIRE AND RIM DIVISION OF THE S. A. E.

On November 22, the Tire and Rim and the Truck Divisions of the Society of Automotive Engineers held a joint meeting in Cleveland at which there was discussed the advisability of revising the present S. A. E. standard for pneumatic tires for passenger cars and motor trucks so as to include, with the exception of the 30 by 3½ and 31 by 4-inch clincher tires, only straight-side tires having 24-inch rim-seat diameters in the 31 by 3½, 32 by 4, 33 by 4½, 34 by 5, 36 by 6, 38 by 7, 40 by 8, 42 by 9, and 44 by 10-inch sizes. The possibility and desirability of obtaining interchangeability of the 6, 7 and 8-inch pneumatic tire rims was also discussed.

PERSONAL MENTION

Owing to impaired health, Van H. Cartmell has retired as president of the Kelly-Springfield Tire Co., New York City, and Frederick A. Seaman, formerly secretary of the company, has been elected his successor. Arthur Sachs, of Goldman, Sachs & Co., has been elected a director.

Joseph C. Weston has been elected president and general manager of the Ajax Rubber Co., Inc., New York City. Mr. Weston went to the Ajax company as vice-president about a year and a half ago from the United States Rubber Co., with which organization and its subsidiaries he was connected in executive capacities for more than twenty years. Horace DeLisser, chairman of the board of directors, had recently been filling the active presidency as well.

Charles Lyman Rand, secretary and chief chemist of the Mitchell-Rand Manufacturing Co., New York City, manufacturer of electrical insulation specialties, has relinquished his duties as factory superintendent to devote his entire time to important research work in the chemical and allied fields for his company. He will be succeeded as factory superintendent by Joseph T. Lawrence, chemical engineer, formerly associated with E. I. du Pont de Nemours & Co.

W. V. Logan, formerly manager of pneumatic truck tire sales for the United States Tire Co., New York City, has been appointed manager of distributers' sales, with full charge of the sale of distributer brands. Mr. Logan, who served as lieutenant in the flying corps of the Navy during the war, is a native of Missouri and is well known in tire circles in St. Louis and throughout the country.

The United States Tire Co., New York City, has appointed C. K. Whidden, formerly manager of solid tire sales, to be manager of truck tire sales, with full charge of the sales of both solid and pneumatic truck tires. The rapid development of truckportation makes Mr. Whidden's new position one of especial importance.

Thomas G. Richards, president and majority stockholder of the Quabaug Rubber Co., North Brookfield, Massachusetts, has resigned his office and the management of the company. Mr. Richards founded the B. & R. Rubber Co. fourteen years ago and later reorganized it as the Quabaug Rubber Co. in which he was active as president and works manager. He retires to enjoy a period of well-earned rest and will doubtless in the near future reenter the rubber trade in a managerial capacity.

Thomas M. Rector, has been appointed director of the department of industrial chemistry of The Pease Laboratories, Inc., successor to the Lederle Laboratories, 39 West 38th street, New York City. He was formerly in charge of the division of food technology of the Institute of Industrial Research, Washington, D. C.

Anthon Berg of Christiana, Norway, who is well known in the United States as an expert in balata belting and asbestos sheet packing manufacture, returned to Norway last month after a brief visit to Akron, Ohio. Mr. Berg is in charge of the erection of a belting and packing plant for De-Erste Nederlandsche Balata Drijfriemenfabriek, Delft, Holland.

JOHN B. TUTTLE, CONSULTING CHEMIST

JOHN B. TUTTLE, consulting chemist, was born in Philadelphia, Pennsylvania, May 25, 1882, and received his education in the public schools and University of Pennsylvania, graduating in 1908 with the degree of Bachelor of Science. On leaving college he joined the staff of the Bureau of Standards, Washington, District of Columbia, at first working on printing inks, oils and gums. Three years later he took up rubber chemistry and was in charge of that department up to 1918, when he resigned to engage in chemical research work for the Firestone Tire & Rubber Co., Akron, Ohio. In 1919 he was made chief chemist of the Firestone Plant No. 2, but recently resigned that position to go into business for himself in New York City.

JOHN B. TUTTLE

Mr. Tuttle is an authority on rubber chemistry and is the author of a number of technical articles on this subject.

In 1911 he was appointed on the United States Navy Department Committee on Rubber Goods Specifications and in the same year made a member of the Joint Rubber Insulation Committee. He also served on the specifications committees of the National Fire Protective Association and the Society of Automotive Engineers for gasoline hose, gasoline hose for airplanes, rubber goods and balloon fabrics.

He is secretary of the Rubber Section of the American Chemical Society which he reorganized in 1916, and a member of the Chemists' Club of New York and the Cosmos Club of Washington, D. C.

A BOOM IN RUBBER HEELS AND COMPOSITION SOLES

One of the results to which the low price of crude rubber has contributed in large measure is a boom in rubber heels and fiber soles. For a time it looked as though the peak of popularity in rubber-soled leather footwear had passed. The present season, however, has witnessed a renewed demand for these goods, and judging from the announcements of shoe manufacturers featuring rubber heels and composite soles for both men and women, all indications point to their use during the coming year on a larger scale than ever. Some of the earlier productions did not stand the test of wear nor hold nailing and stitching well, but experience has led to better methods and compounds, and at

present prices higher grade rubbers can be used. Meanwhile the public has been won to the comfort of walking on resilient footwear and will give greater consideration to this quality in the future. Rubber companies generally report a largely increased demand both from manufacturers and retailers.

Sales of sport shoes thus far have not altogether met manufacturers' expectations, owing, they believe, to dealers holding back their orders on account of the upset condition of the shoe market generally. Retailers assert that advanced prices on this class of footwear have deterred them from placing large orders and point to a drop of some 15 per cent on leather footwear. Sport shoes are still more attractive in price than similar shoes in leather and manufacturers are inclined to await the outcome.

THE RUBBER TRADE IN THE EAST AND SOUTH

By Our Regular Correspondent

NEW YORK AND EASTERN NOTES

ADDITIONS to the Utica Spinning Co.'s mill at Utica, New York, recently purchased by the Dunlop Tire & Rubber Corporation of America, are progressively rapidly, and approximately $2,500,000 will be spent in enlarging the plant to a 36,000-spindle capacity. The additions will cover 150,000 square feet of floor space, or nearly four acres, and include a warehouse covering 35,000 square feet. This plant, which will employ 1,000 hands, will manufacture cord tire fabric exclusively, producing at the rate of 344,000 pounds each month.

Frederick C. Walcott, president of the Dunlop Tire & Rubber Corporation, is also president of the Utica Spinning Co.; P. D. Saylor is vice-president and general manager of both companies. Other officials include James J. Boyle, superintendent of the Utica Mill in charge of manufacturing operations, and Richard E. Hatfield, assistant treasurer in charge of commercial operations.

The Walters Rubber Co. of New York, Mineola, New York, wholesale distributer of Federal tires and tubes and Walters red tubes, has increased its capital from $20,000 to $100,000.

The American Chicle Co., New York City, which has completed its new $2,000,000 factory in Long Island City, of which a preliminary description appeared in THE INDIA RUBBER WORLD, July 1, 1919, for the purpose of economy in production will concentrate its manufacturing operations under the one roof instead of maintaining a number of smaller plants. In accordance with this plan, the company's properties in Cleveland, Ohio, and Kansas City, Missouri, have been sold; the factory in Portland, Maine, has been closed and is for sale; and the factory at Rochester, New York, has been closed. The new plant at the Degnon Terminal occupies the entire block, being 200 by 600 feet, six stories high, and is built of reinforced concrete.

At a meeting of the board of directors of the National Aniline & Chemical Co., Inc., New York City, held December 21, Orlando F. Weber offered his resignation as president and F. M. Peters resigned from the board. J. W. Newlean was elected president of the company. Mr. Weber continues as chairman of the board of directors of the National Aniline & Chemical Company, Inc., and has accepted the presidency of the Allied Chemical Dye Corporation. E. L. Pierce, president of the Solvay Process Co., was elected a director, and B. A. Ludwig, C. F. Weber and Dr. L. H. Cone, vice-presidents, of the National Aniline & Chemical Co., Inc.

The highway experts representing every field of interest in modern road improvement who have consented to act on the Lincoln Highway Association's technical committee to determine the final specifications for an ideal section to be financed by the United States Rubber Co., which the Association will construct on the Lincoln Highway next year, comprise some of the best-known highway engineers and commissioners in the United States. The final decision to be reached by the committee is expected to have a far-reaching influence on the future of American road construction.

The General Tire & Rubber Co., Akron, Ohio, has appointed W. A. Young representative for New York State, with offices at 1778 Broadway, New York City.

Recent additions to the personnel of the Syracuse Rubber Co., Syracuse, New York, maker of the Syra-Cord tire, include E. R. Caldwell, general manager; J. B. Losey, assistant general manager; and George C. Mecklin, head of the calender department. Associated with Mr. Mecklin is W. F. Fike, both men being well known for their success in tire building and calendering. G. R. Loggie, formerly general manager, has resigned to become distributer for central New York State.

The Holly-Wood Chemical Co. has removed its office from 101 Beekman street, New York City, to its plant at 2005-2009 Palmetto street, Brooklyn, New York.

The Kelley Tire & Rubber Co., Inc., New Haven, Connecticut, whose factory at West Haven is nearing completion, expects to start production in February, with an initial output of 500 tires per day.

SOUTHERN NOTES

The Standard Rubbers Finance Co., 708 Common street, New Orleans, Louisiana, recently incorporated to manufacture automobile tires, inner tubes and a general line of mechanical goods, intends to break ground for the first unit of its new factory after the first of the year. Officers of the company are: L. C. St. Germain, president; G. W. Gish, vice-president and general manager; John T. Powers, Jr., secretary; J. M. Olivier, treasurer; John R. Hunter, general counsel. Mr. Gish, the vice-president and general manager, has been active in the rubber industry for the past fifteen years, and has been connected with the Quaker City Rubber Co., the Ehman Tire & Rubber Co., and other prominent rubber companies.

PENNSYLVANIA NOTES

The new Philadelphia sales branch of The Mason Tire & Rubber Co., Kent, Ohio, will cover eastern Pennsylvania, part of Delaware, and southern New Jersey. It is in charge of Leslie W. Weir associated with E. J. Stoeser.

The Plexus Tire & Rubber Co., Inc., Tacony, Philadelphia, has installed new machinery in its factory at State road and Levick street that will enable it to increase production to 2,000 tubes per day. The company reports most encouraging sales of its "Tuf" tubes, and is also developing a line of small molded goods, including druggists' sundries, plumbers' supplies, rubber tubing, windshield rubber and channel rubber.

Recent additions made by the Westinghouse Electric & Manufacturing Co. to its works at South Philadelphia, Pennsylvania, include a new foundry building of the "daylight" design, 120 by 200 feet, which will be used to make castings weighing from one-half pound to one-half ton; also a three-story warehouse, with 86,650 square feet of floor space; two pattern storage buildings, 30 by 256 feet; and two garages to accommodate a total of 60 cars. The new extensions will practically double the employed force, which now numbers 3,500 workers.

The Belmont Packing & Rubber Co., 133-35 North Second street, Philadelphia, is negotiating with the George Kessler Contracting Co., Drexel Building, for the erection of an addition to its factory. The new building will be 130 by 120 feet, one story and basement, and will be used for the storage of raw materials and to take care of increased production in the flax spinning and asbestos textile departments.

A. F. Alexander has been appointed district manager of the Philadelphia branch of the Owen Tire & Rubber Co., Cleveland, Ohio, with offices at 719 North Broad street. This

branch will look after distribution and sales in a territory extending north to New York State and south to the Carolinas.

The Rogers Rubber Co., Inc., Century Building, Pittsburgh, Pennsylvania, manufacturer and distributer of the Rogers revolving rubber duplex heel, on which patents are pending, has the following officers: B. M. Anderson, president; B. D. Cochran, vice-president, and H. Woodward Rogers, treasurer and general manager, who is also the inventor of the Rogers heel.

THE RUBBER TRADE IN NEW JERSEY

By Our Regular Correspondent.

TRENTON NOTES

THE RUBBER MANUFACTURERS of Trenton continue to feel the slump in business, general throughout the country. Both the Bergougnan and the Joseph Stokes Rubber companies are practically closed down. The Joseph Stokes Co. employs about 1200 hands, and all except a few have been laid off temporarily. Other Trenton rubber plants have also laid off a number of employes, including the Whitehead Brothers' Rubber Co. It was believed that the depression would not affect concerns making mechanical goods; however, the slump in this line is due largely to the slackening up of all manufacturing industries.

At the annual meeting of the Trenton Rubber Manufacturers' Association held at the Trenton Country Club on December 13, the name of the organization was changed to the Rubber Manufacturers' Association of New Jersey, for the purpose of widening its scope and admitting to membership all rubber concerns in New Jersey. There are about fifteen rubber manufacturers in New Jersey, outside of Trenton, who will eventually become members of the state body. Previously the membership was confined to Trenton rubber concerns and a few others near by. The New Jersey Car Spring & Rubber Co. and the Voorhees Rubber Manufacturing Co., both of Jersey City, have already become affiliated with the new association.

The following officers were elected: president, John S. Broughton, president of the United & Globe Rubber Co.; vice-president, Charles E. Stokes, of the Home Rubber Co.; treasurer, A. Boyd Cornell, of the Hamilton Rubber Manufacturing Co.; secretary, Henry Sayen, of the Mercer Rubber Co., Mercerville, New Jersey. Mr. Broughton has held the office of president for some time. Following the business meeting a banquet with music was served.

The Thermoid Rubber Co., Trenton, has completed the erection of a building to be used for the manufacture of brake lining for automobiles. The structure is one story, 50 by 80 feet. Several other additions were recently added to the plant.

Harry Knoebel, a traveling salesman for the Thermoid Rubber Co., Trenton, has resigned to join the sales forces of the Neidt-Ertel Motor Co., Trenton.

The Hamilton Rubber Manufacturing Co., Trenton, has completed a brick building on Mead street, to be used as an entrance for employes. The new entrance is provided with time clocks.

Charles Howell Cook, treasurer of the Hamilton Rubber Co., Trenton, has again been elected president of the Mercer County Health League, which was organized two years ago to fight tuberculosis. Mr. Cook devotes considerable time to this work and also to Boy Scouts of Trenton. He is frequently called upon to give talks on health at various rubber factories.

Samuel E. Lovery, for a number of years connected with the Fineburg Auto Tire Co., Trenton, has resigned to follow another line of employment.

The City Rubber & Supply Co. has leased the Ashton building at 13 North Warren street, Trenton, and is handling fabric and cord tires.

The Nearpara Rubber Co. recently completed a new plant at East State street and Whitehead's road, Trenton. A year ago the plant in East Trenton was destroyed by fire, and later Hyman A. Rosenthal, the owner, purchased two and one-half acres in the eastern section and erected a more modern plant. The company makes reclaimed rubber for the hard rubber and wire trade.

H. W. Kugler was elected president of the Globe Rubber Tire Manufacturing Co., Trenton, at the last meeting of the board of directors.

MISCELLANEOUS NEW JERSEY NOTES

The recently incorporated Old Hickory Tire Co., with a capitalization of $3,500,000, and a principal office at 790 Broad street, Newark, New Jersey, will manufacture automobile, motor truck and motorcycle tires and tubes; also automobiles, motor trucks, motorcycles and other vehicles and rubber goods of all kinds. The capital stock is divided into 140,000 shares of the par value of $25 each, while 40,000 shares are to be preferred stock and 100,000 shares are to be common stock. The holders of the preferred stock will not enjoy any voting privileges, but will receive dividends of eight per cent. The new company contemplates the erection of a factory.

The Common Council of Vineland, New Jersey, has a proposition in hand for the location of a large rubber manufacturing concern at that place. It is reported that the new company has purchased a plot of ground on the Oak road and will erect a plant there.

The Uneeda Tire Co. has removed from No. 261 to No. 266 Halsey street, Newark, New Jersey, where it has leased a portion of the building.

Four departments of the American Hard Rubber Co.'s plant at Butler, New Jersey, have been placed on a four-day-a-week schedule.

The Cigol-Behrens Rubber Manufacturing Co., Lodi, New Jersey, which was recently incorporated to manufacture molded rubber goods, plumbers' supplies, toy balls and hollow rubber goods of every description, has purchased the plant and equipment of the Lodi Corporations, which manufactured under the names of Mattson Rubber Co. and E. J. McCormick Rubber Co. The officers include J. H. Behrens, president, and Louis G. Davenport, secretary.

The Atlantic City Tire & Rubber Co., Atlantic City, New Jersey, has secured a factory site comprising an entire block on Virginia avenue, from Mediterranean to Drexel avenues, and will erect the first unit of its factory for the production of high-grade cord tires and tubes. The officers are: A. Lincoln Pearce, president; Robert M. Pearce, vice-president; Charles P. Hill, treasurer; A. C. Pritchard, secretary.

For the purpose of conserving the assets of the companies, application has been made by the officers of the Stanwood Rubber Co., Elizabeth, and the Hardman Rubber Corporation, New Brunswick, New Jersey, for the appointment of receivers. John H. Kirkpatrick of New Brunswick was appointed receiver of the Stanwood Rubber Co. and Edmond A. Hayes, also of New Brunswick, was appointed receiver of the Hardman Rubber Corporation. Negotiations are said to be nearly consummated for a merger of these two companies with two large solvent companies in the Mid-West, one condition being that the obligations of the Stanwood and Hardman companies shall be discharged as they mature.

THE SERIAL NUMBERS APPEARING ON THE SIDE-WALLS OF AUTOmobile tire casings should be kept on record by their owner just as carefully as he keeps the number of his watch. Casings lost or stolen can often be traced by this means. Repair men will cooperate by keeping these records for their customers. Such records are also useful in keeping mileage and service data.

AMERICAN DUNLOP FACTORY NEARLY COMPLETED

One of the finest modern tire factories in the country is the new plant of the Dunlop Tire & Rubber Corporation of America, at Buffalo, New York, the completed buildings now covering over 35 acres of the 214-acre site purchased by the company, one mile north of the city. According to the London *Financial Times*, a letter from P. D. Saylor, vice-president and general manager of the Dunlop Tire & Rubber Corporation of America, in reference to the company's position, has recently been issued by the Dunlop America Trust Co. The latter is the pool which controls the disposition of the American company's shares, and the Dunlop Rubber Company's 25 per cent ordinary interest is vested in that concern. The letter gives a full account of the scope of the American company's activities and is quoted in part below:

"The contract for the erection of the factories was placed with the Foundation Company of America on January 24, 1920. The buildings contain a floor space of 1,250,000 square feet—28 acres—and such progress has been made that the buildings will be completed before the winter sets in.

"The buildings under construction will afford facilities for manufacturing the following weekly output: 30,000 automobile pneumatic tires of the straight-side type; 6,500 automobile pneumatic tires of the clincher type; 5,000 automobile pneumatic truck tires; 2,500 solid rubber tires; 40,000 tubes.

"Starting at zero, January 1, 1920, production will gradually be increased until by the end of 1921 approximately full production will be reached. The value of this year's output is estimated at $25,000,000. As the factory is expected to be in full production by the end of 1922, it is estimated that the value of the output for the year will approximate $96,000,000.

"There is a steadily increasing demand for tires of cord construction all over America, and no great difficulty is anticipated in disposing of the entire output of our plant, as the company's will be the only large factory in America devoted exclusively to the manufacture of this type of tire.

"We feel justified in saying that never in the history of the tire industry has any company started with greater prospects than the Dunlop Tire & Rubber Corporation of America."

FIRESTONE TRUCK TIRES EQUAL TO SEVERE TEST

The contention of tire builders that insertion of gum between the plies in pneumatic truck tire treads reduces friction resulting from hard usage was admirably supported in a recent truck test run made on the Indianapolis motor speedway by a Duplex stock truck equipped with Firestone cord tires, according to experts from the Firestone company who witnessed the test. A machine weighing 4,300 pounds and carrying a 3,300-pound load was driven around the speedway for a continuous 24-hour period at an average rate of 39 miles per hour. Including 150 miles in preliminary tests, the truck traveled 1,085 miles and on the concluding lap reached a speed of 44.5 miles per hour. The average weight borne on each tire was 1,570 pounds front and 2,562 pounds rear, and each tire was inflated to 100 pounds' pressure. The slight temperature increase indicated the value of gum between the tread plies and showed that higher than ordinary pressures aid to prevent heat generation. At the finish of the run the 35 by 5-inch ribbed front tires showed cross wear at an angle with the tread caused by turning corners in the same direction; the 38 by 7-inch nonskid rear tires showed no trace whatever of wear.

THE LEE TIRE & RUBBER CO.

IN ORDER to establish a successful business the founder must be possessed of three things—faith, hope and capital, and most business men will assert that the greatest of these is capital. J. Ellwood Lee possessed all three requisites when he was twenty-three years of age, so he severed his connection with the establishment of William Snowden & Co., Philadelphia, and setting to work in an attic at Conshohocken, Pennsylvania, he began the manufacture of surgical rubber goods. His faith and hope were limitless; his capital, $28.35.

Five years later, Mr. Lee secured articles of incorporation for a permanent organization with a capital of $75,000, which by 1894 was increased to half a million. By the end of the next decade the J. Ellwood Lee Co. had reached a high place in the trade, second only to the firm of Johnson & Johnson, New Brunswick, New Jersey, with which company it later merged, although each company retained its own identity.

PLANT OF THE LEE TIRE & RUBBER CO., NEAR PHILADELPHIA, PENNSYLVANIA

When the automobile industry began Mr. Lee was quick to see a promising future for tires, and in 1909 he installed complete tire-making machinery in the factory. The next year his great success and increasing business warranted the organization of a new company under the name of the Lee Tire & Rubber Co. A plot of 27 acres was obtained in Spring Mill, Pennsylvania. Modern buildings were erected, including a four-story concrete building, 80 by 400 feet, for offices, assembling, receiving and shipping purposes, and a two-story brick building of the same dimensions for manufacturing and power plant. Here 900 people are now employed and 2,500 tires daily can be produced when the plant is running to capacity.

The death of Mr. Lee, which occurred April 8, 1914, was a great loss to the company, of which he was then president, as his inventive genius and organizing and executive ability had done much to further the success of the firm.

Anyone who has visited Atlantic City will probably recall the huge illuminated signboard, 75 feet in length, set at the head of the boardwalk, on which is reproduced in miniature the beautiful Lee factory in its picturesque setting in the valley of the Schuylkill, fourteen miles from Philadelphia.

The Lee Tire & Rubber Co. specializes in its puncture-proof tire (that "smiles at miles"), in addition to manufacturing all regular styles of automobile and truck tires.

THE RUBBER TRADE IN MASSACHUSETTS

By Our Regular Correspondent

AS ELSEWHERE throughout the country, the rubber trade in Massachusetts remains quiet, especially tire manufacture. Footwear production has been more nearly normal, but with advance orders for rubbers and arctics taken care of and a mild winter in prospect, factories are now running on part time schedules or have shut down for inventory taking, repairs and the holiday season. Increased activity is anticipated, however, after the new price-lists for tennis lines are issued about January 1, 1921. Meanwhile, wage schedules are undergoing readjustment in conformity with the slump in the raw material market and the public demand for lower price levels.

Massachusetts rubber manufacturers are optimistic regarding the future, the recent statement of M. M. Converse, president of the Converse Rubber Shoe Co. in the *Boston Evening Record*, typifying the consensus of opinion among them. He writes:

While it is a fact that in many industries there is at the present time a slacking up in the demand for goods, it is not due to conditions that should cause apprehension. Instead, it is quite the reverse. The present situation means a liquidation of surplus stocks that the manufacturer, the wholesaler, and the retailer have all felt obliged to carry for the past three years to overcome the shortage of merchandise and the lack of transportation facilities, thereby enabling them to serve their customers. This created an abnormal situation, and abnormal situations are always dangerous. However, everything is now working back to normal, and this means a healthy situation in 1921. We should see during the year the stabilization of industry that has been freely predicted and that has been inevitable since the beginning of abnormal times. I believe 1921 will be one of the most prosperous years in the history of the country.

The New England Tire & Rubber Co., which started business in Holyoke, Massachusetts, last June, has placed its Holyoke cord tire on the market. The New York City salesroom is located at 43 East 47th street, and the Boston distributer is the City Rubber Co., 288 Columbus avenue. F. E. Powers is Boston representative with an office at 161 Devonshire street. The firm's new plant at Holyoke is about one-third completed. The officers and directors of the company are: president, John Kearns, vice-president and general manager of the Lee Tire & Rubber Co.; vice-president and production manager, E. J. Kearns, formerly with the Fisk, Lee and Dunlop companies; treasurer and general manager, C. S. Huntley, president of the Midco Tire Co. and organizer of the Delion Tire & Rubber Co.; directors, the foregoing and George K. Culp, of the United States, Mid-Continent and other companies, W. C. Van Brunt, Joseph F. Granger, T. F. Morris, F. W. Callahan, J. Sidney Bernstein and Frank J. O'Neil.

The plant of The Fisk Rubber Co., Chicopee Falls, Massachusetts, like numerous others in this state, has been operating for several weeks past on a schedule of three days a week in order to find partial employment for as many operatives as possible.

A reduction of 15 per cent in wages, effective December 6, has been accepted by the employes of the Tyer Rubber Co., Andover, Massachusetts. Full time, following several weeks of a three-day week schedule, is a possibility in the near future.

Owing to the belief that prices of foodstuffs, already falling rapidly, will soon return to normal, the Hood Rubber Co., Watertown, Massachusetts, has closed its cooperative grocery store established in 1916 which often served 2,000 customers daily.

The plant of the Cambridge Rubber Co., Cambridge, Massachusetts, which closed December 15, resumed operations December 27. The footwear department of the business has been idle for a longer period.

The Insurance Commissioner has recently approved a new schedule of manual rates for Workmen's Compensation in the State of Massachusetts effective at midnight December 30, 1920, and applying to policies expiring in January or February, 1921. The classifications of interest to the rubber trade follow:

	Old Rate	New Rate
Rubber goods manufacture	$1.97	$1.60
Rubber boot and shoe manufacture	.83	.76
Rubber garments manufacture (including rubber mill)	.69	.76
Rubber garments manufacture (no mill)	.45	.25
Rubber belting manufacture	1.35	1.60
Rubber reclaiming	4.10	1.85
Rubber tire manufacture	1.23	1.30

Under the disability insurance plan effective since June 1, 1920, in the plant of the Converse Rubber Shoe Co., Malden, Massachusetts, compensation is on the following basis: employes rated as foremen will be given full pay for any period up to twenty-six weeks from date of disability; assistant foremen and all other salaried or "straight time" employes full pay for two weeks from date of disability and thereafter 90 per cent of their pay for any period up to and including twenty-five weeks.

As an incentive to thrift, *Converse Folks*, the factory magazine of the Converse Rubber Shoe Co., Malden, Massaschusetts, is starting a savings bank account to the amount of $5.00 in the name of every baby born whose father or mother is at the time in the company's employ, *Converse Folks* acting as trustee. On the child's first, second, third, fourth and fifth birthdays *Converse Folks* will deposit to the account $1.00, $2.00, $3.00, $4.00 and $5.00 respectively, so long as the parent is in the company's employ, and provided the parent adds at least $5.00 to the amount every year. In the event of the parent's failure to pay the specified amount before the child's first birthday, the original deposit reverts to *Converse Folks*. Similar neglect in any subsequent year closes the account as it stands, the parent becoming trustee of the amount on deposit. Should the parent leave the company's employ before the child's first birthday, the original $5.00 deposit reverts to *Converse Folks*. After the child's first birthday the entire account may be withdrawn if the parent wishes. On the child's fifth birthday, if the account has been maintained, the parent becomes trustee of the account, which amounts to at least $45.

The Hood Rubber Products Co., Inc., Watertown, Massachusetts, has been awarded the contract by the Bureau of Supplies and Accounts, Navy Department, to furnish 30,000 pairs of rubber overshoes for various naval stations at $30,000. Bids for these were opened on November 23.

Frederic C. Hood, treasurer of the Hood Rubber Co., Watertown, is one of the directors of the newly organized Association for the Promotion and Protection of Savings, Inc., for helping employes to learn and practice the principles of thrifty living, systematic saving and wise investment. The Associated Industries of Massachusetts has been the prime mover of the organization. Membership is open to individuals, firms, corporations and associations, all of whom are entitled to the use of films, slides and literature for plant meetings of employes and material for shop publications, all of an educational character regarding savings and investments prepared by the Association.

George A. Torrey, sales manager of the Tyer Rubber Co., Andover, is making his annual trip to the Pacific Coast.

The Tyer Rubber Co., Andover, reports very satisfactory results from its employment and service department, which was organized in July, 1919. A very marked reduction of the labor turnover was maintained under the generally trying labor conditions of the past year. One of the chief accomplishments of the department has been the organization of the Tyrian Service Association, the plan of which was outlined in THE INDIA RUBBER WORLD of February 1, 1920. It has been responsible for numerous social events which have promoted good fellowship among the employes, and for the organization of athletic activities. It has assisted in the installation of a plan for savings, conducted a plan for cooperative buying, and created a fund to bring comfort to sick employes, known as the Happy Thought Fund, from which ninety-five gifts were made during the year.

The work of the health department of the company has also been effective, and by its efforts lost time through illness and accident has been much reduced.

BOSTON NOTES

George Green, formerly associated for many years with Samuel Grow, has returned as general sales manager of the George Grow Tire Co., Boston, and director of the automobile end of this fast-growing business. Mr. Green is well known throughout the New England automobile and accessory trade. With Mr. Grow he regards the enlargement of the Canton Junction plant to a capacity of 800 tires a day as necessary to meet the Spring boom which dealers here believe is certain to come.

The Atlantic Rubber Co., formerly at Atlantic, Massachusetts, has opened offices at 88 Broad street, Boston. A few more lines of rubber goods are being added.

Archer S. Pratt, for fourteen years associated with T. C. Ashley & Co., 683 Atlantic avenue, Boston, manufacturers of rubber substitutes, has retired from that firm, which will be continued by Thomas A. Ashley.

Some fifty prominent automobile dealers and other business acquaintances at the Hotel Kenmore, Boston, recently tendered a farewell banquet to W. E. Dermody, for three years Boston branch manager of The Goodyear Tire & Rubber Co., who has been transferred to a more important position at the Akron, Ohio, factory. The dealers presented him with a beautiful silver service, while close associates gave him a platinum and gold watch chain. Mr. Dermody was held in high esteem by many friends who, while rejoicing in his well-earned advancement, regret his leaving.

The C. C. C. Fire Hose Co., maker of fire hose and mechanical rubber goods, 209 Washington street, Boston, Massachusetts, at a recent meeting elected James J. Clifford president of the company. Mr. Clifford was for three years president of the Plymouth Rubber Co., resigning from that office in July, 1920. Previously he had been for nine years connected with the Boston Woven Hose & Rubber Co. Other officials of the C. C. C. Fire Hose Co. are: Royal K. Abbott, vice-president and treasurer; William J. Bingham, secretary; Charles M. Olcott, assistant treasurer. The directorate includes, besides the officers mentioned, Horatio Gilbert, Luther S. Newell and W. Lloyd Allen.

THE RUBBER TRADE IN RHODE ISLAND

By Our Regular Correspondent

THE YEAR 1920 comes to a close with practically every line of industry at a low ebb for the first time since the beginning of the World War in August, 1914. As a result of this general business depression, which has apparently reached its lowest point, there is the largest number of employes idle that has been reported in many months. Whereas, since the summer of 1914 there has been a dearth of men to fill the jobs, there is now a dearth of jobs for the men who are out of employment. In New England the textile industry is one of the hardest hit and all kinds of productions are affected, including the manufacture of fabrics for automobile tires. In keeping with other lines of industry the rubber manufacturing plants have felt the influence of the downward trend and most of them, especially those manufacturing footwear, have reduced their working forces, curtailed the weekly schedule of production and several have been closed down for varying periods during the past month. In consequence of these curtailments the outlook was far from encouraging, especially as the continued pleasant weather has had a tendency to restrict sales of rubber footwear.

Just after the middle of the month, however, a more optimistic atmosphere began to prevail because of the brighter outlook for the industry that was forecasted in the report that the United States Rubber Co., the parent concern, was receiving large seasonal orders for the products manufactured in its various plants in this State. These reports were that the company was receiving daily substantial orders for rubbers and the lighter arctics, and it is believed that these orders should materially assist in tiding over the Rhode Island mills for the next few months and avert any further shut-downs. During the month of December the plants of the National India Rubber Co. at Bristol, the Alice Mill of the Woonsocket Rubber Co. at Woonsocket, and the Millville plant of the same concern at Millville were closed from one week to three, and the Revere Rubber Co.'s plant in Providence was forced to lay off several hundred of its employes for varying periods. At the American Wringer Co.'s plant at Woonsocket, there was also a curtailment of working forces and a partial shut-down.

In the course of a tour of inspection of New England fabric mills that are furnishing fabric for Firestone tires, a party of officials of the Firestone Tire & Rubber Co. arrived in Providence, December 2, and looked over the local Firestone branch of which Harry J. Aitken is manager. In the party were H. S. Firestone, president; J. W. Thomas, vice-president in charge of production; L. G. Fairbanks, vice-president in charge of sales, and S. G. Carkhuff. The party were on their way from New York to Boston.

Suit brought against the Kokomo Tire Co., of 205 Hoppin Homestead building, Providence, by Emile Bresse, of East Providence, for alleged broken promises, for which the original damage of $200,000 was reduced by Justice Tanner, of the Superior Court for Providence County, to $50,000, is expected to go to trial soon. The plaintiff claims that the defendant agreed, in return for the sole patent rights of a certain article, to pay the plaintiff $1,000 in cash, $5 weekly and a royalty of 50 cents each on not less than 15,000 of the articles to be manufactured each year for at least five years. The plaintiff claims the contract provides that if the article was not satisfactory the contract was void. The defendant contends that it did not make the agreement as represented by the plaintiff.

The Firestone Tire & Rubber Co. has entered suit in the Superior Court, Providence, against the International Truck Co. of Rhode Island, Abraham Luff, and the Industrial Finance Corporation, to recover the proceeds of five notes, each for $1,000. The damage is placed at $10,000. The first note was made July 10, 1920, and was payable September 10, it is alleged, and by the terms of each of the series of five notes, all became due immediately after any one was defaulted. Mr. Luff and the Industrial Corporation are indorsers on the notes.

According to a statement filed with the Secretary of State last month, the Joseph Banigan Rubber Co. of Woonsocket, a Rhode Island corporation, has amended its charter, reducing its capital stock from $1,250,000 to $1,000. In order to accomplish this object, the company has voted to purchase at par and retire 12,490 shares of capital stock. This is one of the subsidiaries of the United States Rubber Co. and Walter S. Ballou is president.

The Rubber Boot and Shoe Workers' Protective Association of Providence, created for moral and social advancement, has received a charter under the laws of Rhode Island. The incorporators are Edward E. Colebert, Emil Schall, A. Henry Vincent, Mathew H. Brennan, James H. Liddy, Herman Carlson and John Ginnette.

THE RUBBER TRADE IN OHIO

By Our Regular Correspondent

AKRON NOTES

UNDER the refinancing plans of The Goodyear Tire & Rubber Co., approved at the postponed stockholders' meeting December 24, the capitalization of the company was decreased from $100,000,000 to $50,000,000, and the outstanding common stock with a par value of $100 per share will be exchanged for

common stock of no par value, while the outstanding preferred stock will be exchanged for new preferred stock with the same rights and privileges as those now carried by the preferred stock, together with the additional exclusive right for voting, or controlling the board of directors.

At the same time the stockholders, including the preferred stockholders, authorized the issuance of first mortgage bonds to the extent of not more than $50,000,000, which will be taken over by bankers and sold to finance the reorganization of the company.

The new mortgage bonds will carry 8 per cent interest and will run for a term of twenty-five years. It is understood that in addition to the 8 per cent interest the bankers will receive 2½ per cent of the net profits of the company during the life of the bonds.

W. E. Palmer has retired as treasurer of the company to become secretary, and T. Jackson, representative of the new banking interests, has been elected treasurer. H. J. Blackburn and H. H. McClosky, Mr. Palmer's assistants, will be given other positions in the company.

In a letter to the stockholders, F. A. Seiberling, president of the company, stated that the refinancing of the company was made necessary by the fact that the company's annual budget was made up to meet a production of $250,000,000 worth of goods, and when the financial depression came the company was caught with large supplies of raw material purchased at war and post-war prices, making the inventory unduly high.

This rendered it impossible to meet the credit demands of the company and necessitated borrowing $28,800,000 until February 15, 1921, to carry the inventory and give bankers and company officials time to make plans for the permanent refinancing of the company.

Although the details of these plans are not yet complete, the New York bankers who are making the negotiations have let it be known that they will control 51 per cent of the stock of the company for a term of years, and through the newly appointed treasurer will control the financial operations of the company.

The manner in which Akron bankers and business men have stood by Mr. Seiberling during the dark hours through which the company has passed is a wonderful tribute to their confidence in his business ability and hopes for the future.

The Firestone Tire & Rubber Co., Akron, has elected the following officers: H. S. Firestone, president; A. C. Miller, and Thomas Clements, vice-presidents; S. G. Carkhuff, secretary; and J. G. Robertson, treasurer. The former directors were reelected. Plans for improving plant facilities include a railroad system connecting all factory units and cooperating with the trunk line now running parallel to the Firestone factory.

The announcement of the Firestone Tire & Rubber Co. that quarterly dividends will be reduced from $2 to $1.50 per share, in order to conserve cash resources during the present readjustment period, and salaries of the office force cut 10 per cent was anticipated, and similar action on the part of other concerns will not be a surprise. Factory employes have been working on part time schedule, and this fair-minded method of meeting the financial crisis by sharing the burdens as the prosperity has been shared in the past is a typical Akron view of the matter. It is for this reason that practically no protest has been heard from the salaried employes or stockholders regarding the decrease in the earnings or investment returns. Salaries were increased 20 per cent during the past year in order to meet rising living costs.

The numerical factor regulating the production of tires will hereafter be changed from the theoretical six tires consumed a year per automobile in the United States to probably four or five, according to rubber men in Akron.

Much of the present difficulty in which the tire industry finds itself is due to the fact that production was hitherto based upon an assumption which experience has shown to be no longer correct. Upon this basis plants were expanded and raw materials purchased, but when trade slackened the fact that consumption had been overestimated became painfully apparent.

The decrease in the number of tires used by each automobile is due largely to the better quality of tires manufactured during the last two or three years. The cord tire travels perhaps twice as far as the former fabric tire, and the fabric tire itself is better built. Then, too, rubber companies have educated motorists so efficiently and so persistently in the care and use of tires that longer average service has resulted.

Chester A. Graham, formerly Americanization secretary of the Young Men's Christian Association, has been named Americanization director of the public schools, succeeding E. C. Vermillion, who resigned recently to take a similar position at Pittsburgh, Pennsylvania. The Americanization department has felt the slackening of industries here, more than 25 per cent of the men and women who registered early this fall having failed to make their appearance at classes.

The public schools, under the new administration of C. R. Reed, have entered into the field of occupational education. An automobile school has been established, where the repairing and driving of automobiles is taught by four teachers to classes numbering more than 300 boys and girls or men and women.

The plant of the B. & W. Rubber Co., located at Holmes and East Tallmadge avenues, Akron, will be ready for operation in approximately ninety days, according to officials, and will employ approximately 100 persons. Mechanical rubber goods will be manufactured, and a specialty made of rubber heels. The officers are: H. A. Backderf, president; D. B. Campbell, vice-president; Eric Richards, treasurer, and Mary E. McGowan, secretary and assistant treasurer.

W. A. Johnston, president of the Rubber Products Co., Barberton, has been elected president of the recently organized Chamber of Commerce of Barberton. This organization of rubber and other business men is assisting to solve some of the important problems resulting from an increase of more than 99 per cent in population during the past ten years.

Akron rubber concerns look upon the success of the community chest plan to raise $500,000 for Akron's charity and welfare organization as a new vote of confidence by the people.

When the workers, headed by T. E. Smith, editor of the *India Rubber Review*, entered the campaign they did not fail to realize that the temporary business depression had greatly decreased the giving power of the people of Akron.

But the charities had to be supported, and when the chest was filled the officials of the community chest and rubber men generally felt that the people who know the rubber industry from an intimate view-point had stated in no uncertain terms that the future of the industry is bright, although at present there are only the faintest beginnings of a revival in tire manufacture.

News comes that Edward S. Babcox, formerly advertising manager for the Firestone Tire & Rubber Co., has acquired a substantial interest in the *India Rubber Review*, of Akron, Ohio. To those who do not know this latest recruit in rubber journalism, the name and the state he lives in may suggest the last Democratic aspirant for the president. Mr. Babcox, however, is not a politician. On the contrary, he is a past master in the art of industrial advertising, a forceful writer, a keen critic, and withal a live, energetic and very likable gentleman. We wish him all success.

The Rubber Engineering Co., Akron, formerly at 46 South Broadway, will be located at its new offices at 437 First Second National Building after January 1, 1921. The officers are W. F. Ridge, president; W. E. McCormish, secretary.

On its twentieth anniversary, the Firestone Tire & Rubber Co. issued a statement in which total sales of $114,980,969 for the

past year were made public, of which $9,396,912 represent net profit after $8,151,749 have been charged off as inventory shrinkage. The volume of business done during the past year is 26 per cent over the business done during the previous year, in spite of the business depression which has been felt in the tire industry during the past five months. Current assets are given as $73,732,503 and total assets as $107,404,200.

The Canadian plant was not completed during the past year because of the inability of the company to obtain contractors to do the work, but will be finished early next year. The rubber preparation plant at Singapore is now in operation, and the steel plant and the mechanical building in Akron will be put into operation when business demands their use.

H. S. Firestone, president of the company, is confident that the ensuing year will see the company grow in strength and stability. Regarding the rubber industry and its future, Mr. Firestone said: "Our industry has become fundamentally sound through its close affiliation to proven automotive transportation, and its scope will broaden with nation-wide good roads projects financially assured through legislation."

At a recent meeting of the industrial assembly of The Goodyear Tire & Rubber Co., Akron, N. P. Woodward was elected president of the senate by a vote of 11 to 3. J. P. Long was reelected speaker of the house. A full membership was present in the house and 19 members of the senate were present. The Goodyear industrial republic was described in THE INDIA RUBBER WORLD for November 1, 1920, page 124.

Arthur Ostman has been appointed head of the testing department of the motor division of the Wellman-Seaver-Morgan Co., Akron.

Arthur E. Warner was recently appointed chief chemist of the Firestone Tire & Rubber Co., Akron.

CLEVELAND NOTES

The Safety Equipment Service Co. has moved from 215 St. Clair avenue to its new building at East Eleventh street and Hamilton avenue, Cleveland, Ohio. In its larger quarters it will carry more stock and render a service adequate to the needs of America's industrial safety requirements.

The Ramsdell Bros. Co., formerly at 2102 Euclid avenue, has removed to 3430 Superior avenue, Cleveland, Ohio. C. R. Johnson, who was manager of the development department of The Goodyear Tire & Rubber Co., Akron, has been elected vice-president of the company, in charge of truck tire service.

MISCELLANEOUS OHIO NOTES

The Mason Tire & Rubber Co., Kent, Ohio, has appointed J. J. Flynn purchasing agent, succeeding C. D. Rockwood, and J. B. Paltz assistant purchasing agent. Mr. Flynn, who has been assistant purchasing agent for the past fifteen months is well equipped with experience, having been with the Northern Ohio Traction & Light Co., Akron, as acting purchasing agent, where he also organized that company's valuation department and operated the stores department. Previously he was connected with the Cleveland Railway Co.'s valuation department for about three years. Mr. Paltz was formerly connected with the purchasing department but for a number of months had been in charge of the salvage department.

The factory engineering department of The Mason Tire & Rubber Co., Kent, Ohio, which was organized in August of this year with H. W. Sidnell in charge, has made several changes in personnel. D. D. Williams is now in charge of raw materials, Lee Clough in charge of tire design, and E. B. Harvey is at the head of the planning department.

The Maumee Tire & Rubber Co., 705 Madison avenue, Toledo, Ohio, has purchased fifty-one acres of land upon which will be constructed a tire manufacturing plant with facilities for the production of 5,000 tires a day.

The Rotary Tire & Rubber Co., Zanesville, Ohio, has appointed as agents Courtland P. Ely, 1339 Linwood avenue, and H. F. Van Etten, 194 North Oakley avenue, Columbus, Ohio.

The Eclat Rubber Co., Cuyahoga Falls, Ohio, which specializes in rubber tubing, is now entering into production of high quality red and gray automobile inner tubes made circular ring shape in sizes from 3 to 5 inches.

The Toycraft Rubber Co., Ashland, Ohio, which was incorporated September 26, 1919, with a capital of $25,000 to manufacture and market toy balloons for the trade and also for advertising purposes, has been operating at full capacity. In its first year it has built up an excellent sales record and earned the good will of some of the best trade in the country. The officers are: Howard D. Winbigler, president; Charles C. Spies, vice-president and sales manager; Ralph T. Scantlebury, secretary and treasurer.

J. W. Eldred has resigned from his connection with The Swinehart Tire & Rubber Co., Akron, Ohio, to become Ohio representative of the Rubber Corporation of America, New York City, with headquarters at Columbus, Ohio.

Edward J. Brown, of Trenton, New Jersey, formerly western traveling salesman in the employ of the Acme Rubber Manufacturing Co., Trenton, has been made general manager of the branch of the Hood Rubber Products Co., Inc., at 227 Sheedy avenue, East Liverpool, Ohio.

THE RUBBER TRADE IN THE MID-WEST

By Our Regular Correspondent

THE Minneapolis branch of the Firestone Ship-by-Truck Bureau, Akron, Ohio, occupies spacious quarters in the new building at 444 Stinson Boulevard on the Northwestern Terminal, Minneapolis, Minnesota. The terminal consists of a group of modern industrial buildings, centrally located, especially equipped for the economical handling of merchandise. Each building has its own system of side tracks served by the consolidated service of all the nine railroads entering Minneapolis and is connected by tunnel service with the only freight station in the city served by all railroads. The Northwestern Terminal represents the latest development in buildings devoted to transportation.

The Miller Rubber Company, Akron, Ohio, has appointed S. M. Barber manager of its branch at Grand Rapids, Michigan.

The Ilg Electric Ventilating Co. has recently moved from its old quarters at Whiting and Wells streets to its new modern building at 2850 North Crawford avenue, Chicago. This company is profit-sharing and a large per cent of its employes are large stockholders. Its officials are: S. W. Weis, president; J. M. Frank, vice-president and general sales manager; Robert A. Ilg, treasurer and general manager, from whom the company takes its name.

The Monroe Tire Corporation, 1825 South Michigan avenue, Chicago, has recently been incorporated with Harold Samuels, president, and Leroy Eschner, treasurer. Both men are well known in the tire sales trade and their experience fits them to understand dealers' requirements. The company publishes each month an illustrated catalog called "Tire Dealers' News," which lists a variety of the best known makes of tires and also gives a review of market conditions gathered from reliable sources.

The Blekre Tire & Rubber Co., Wabash and Vandalia streets, St. Paul, Minnesota, was incorporated under the laws of Iowa, October 7, 1917, to manufacture tires and tubes and rubber goods. The officers are: E. O. Blekre, president; S. E. Blekre, vice-president and treasurer; G. W. Wells, secretary; B. A. Rheinstrom, vice-president and general sales manager. G. O. Ludcke is advertising manager and W. E.

Greer, superintendent. The Automobile Tire Owners' Tire Corporation, a $3,000,000 corporation having the same officers as the Blekre company, is building in the Midway district the first tire factory in St. Paul, for the manufacture of the Blekre tire. This factory will employ 250 men and it is expected that it will be ready for operation about January 1. It will produce cord and fabric tires and inner tubes and have a capacity of 2,000 tires daily.

The Frogressive Shoe Machinery Co., Minneapolis, Minnesota, manufacturer of shoe machinery, is now manufacturing tire repair shop equipment including vulcanizers, under the name of the P. S. M. Co., at 3116 Snelling avenue, Minneapolis. The officers of the company are: J. H. Martin, president; L. J. Bedard, vice-president; A. C. Bedard, secretary, and S. O. Abrams, treasurer.

The Minneapolis Tire Dealers Association, Minneapolis, Minnesota, organized a short time ago, has the following officers: E. P. Farley, president; F. W. Van Sant, vice-president, and H. F. Lundberg, secretary and treasurer. Mr. Lundberg is with the J. N. Johnson Co., Inc., 1018 Nicollet avenue, Minneapolis, jobber and wholesaler of rubber tires, supplies, fire department equipment, hose, and mechanical rubber goods.

James E. Johnson and Harry Blackman have purchased the interest of W. F. Richley and James F. Brown in the Harmon Rubber & Manufacturing Co., Minneapolis, Minnesota, and will continue the business as a partnership under the name of the Harmon Tire & Repair Co. Mr. Johnson has been an interested and active member of the company since 1915.

The Federal Rubber Co., Cudahy, Wisconsin, has appointed J. J. Williams production manager.

T. J. Hennessy, formerly manager of the accessory and mechanical goods department at the Firestone plant, and A. H. Nellen, formerly chemist and compounder for the accessory and mechanical goods repair materials, are now connected with the Premier Tire & Rubber Co., Montgall and Nicholson avenue, St. Louis, Missouri, as general manager and assistant manager, respectively. R. L. Stealey, recently foreman in the heel press-room of the Goodyear Tire & Rubber Co., Akron, Ohio, now holds a similar position with the Premier Tire & Rubber Co., which manufactures Premier Supertires and tubes, and rubber specialties.

The Ajax Rubber Co., 218-222 West 57th street, New York City, has appointed L. M. Van Riper western sales manager, with headquarters at Chicago. Mr. Van Riper is well known in midwestern tire circles, as he has been district manager at Detroit in charge of Ajax business in Michigan. He is a man of pleasing personality and well qualified to handle the business of the organization.

The India Tire & Rubber Co., Akron, Ohio, has appointed F. W. Abbott distributer for the Minneapolis, Minnesota, territory of the company. Mr. Abbott's contract covers a period of years and involves a large amount of business.

The Mid-West Rubber Manufacturers' Association

Second Annual Meeting and Banquet

THE BANQUET

ABOUT 100 members and guests attended the banquet of the Mid-West Rubber Manufacturers' Association that was held in the evening, December 14, at the Chicago Athletic Association, Chicago, Illinois. In the absence of John T. Christie, the president, John W. Maguire, the former president, occupied the chair. Mr. Christie, however, arrived later in the evening and addressed the assemblage. The principal speaker of the evening was Albert N. Eastman, a Chicago lawyer, who gave an interesting talk on the subject of cooperation in general. A high-class vaudeville enlivened the evening and all departed feeling that they had been well repaid for coming.

THE MEETING

A luncheon was held at noon at the Chicago Athletic Association, followed by the annual meeting at which the following directors were elected under the newly adopted by-laws, increasing the number from seven to twelve, to serve terms of one, two and three years:

TERMS EXPIRE 1924

D. M. Mason, The Mason Tire & Rubber Co., Kent, Ohio.
George B. Dryden, Dryden Rubber Co., Chicago, Illinois.
Paul P. Parker, president, Parker Tire & Rubber Co., Indianapolis, Indiana.
W. W. Wuchter, Nebraska Tire & Rubber Co., Omaha, Nebraska.

TERMS EXPIRE 1923

Harry J. Smith, president, Achilles Tire & Rubber Co., Binghamton, New York.
M. J. Flynn, treasurer, Inland Tire & Rubber Co., Chicago, Illinois.
D. L. Spraker, Kokomo Rubber Co., Kokomo, Indiana.
Thomas Follen, president, Lion Tire & Rubber Co., La Fayette, Indiana.

TERMS EXPIRE 1922

J. B. Gabeline, president, Standard-Four Tire Co., Keokuk, Iowa.
Charles J. Venn, president, Century Rubber Works, Chicago, Illinois.
Walter R. Denman, general manager, Denman-Myers Cord Tire Co., Cleveland, Ohio.
Julius Balke, 2nd vice-president, Brunswick-Balke-Collender Co., Chicago, Illinois.

Among those who addressed the meeting were: H. R. Whitehead, textile division, The Mason Tire & Rubber Co., Kent, Ohio; Edward S. Babcox, vice-president, *India Rubber Review*, Akron, Ohio; Dr. S. P. Woodard, president, Gillette Rubber Co., Eau Claire, Wisconsin; J. E. Grady, general manager, Archer Tire & Rubber Co., Minneapolis, Minnesota.

The report presented by H. S. Vorhis, secretary and general manager, was as follows:

As secretary of the Association I wish to report briefly regarding the work of the past year. The first annual meeting and dinner of the Association was held at the Chicago Athletic Association on December 9, 1919, which brought to a close what might well be called the organization year. You all know the service our first president, John W. Maguire, performed during the first formative year, which was instrumental in launching the organization on what is confidently hoped will be a career of usefulness. The dinner last December was attended by 83 members and their guests, and a thoroughly good time was enjoyed by all. At that time there were 38 regular members and 38 associate members—a total of 76 members.

At the January meeting of the Board of Directors, the writer was invited to come to Chicago as secretary and general manager of the Association, an arrangement which went into effect February 1, 1920. Up to July 1 it was possible to increase the membership of the Association in quite a satisfactory manner, but since that time it has been up-hill work, especially as the trade has fallen on such difficult times. In spite of the condition of the trade, however, our membership has increased to 69 regular members and 84 associate members—a total membership of 153 firms—an increase of 31 regular members, or a total of 77 new members. I believe that under ordinary normal conditions it would have been possible to more than double our membership.

Our work as it is being conducted today is two-fold—our monthly meetings in Chicago and our bulletin and information service. The acquaintances and spirit of good fellowship that have been fostered by the monthly luncheon and meeting have been of undoubted benefit to all who have attended, as there is nothing an association can do that equals in value the bringing together in social relations the competing members of the same trade. The discussions that have been held at the manufacturers' meetings as well as at the general meetings after the luncheons have resulted in valuable information being exchanged, and trade conditions gone into carefully. It is hoped that the manufacturers themselves will take more advantage of these meetings in the future, for they can make them most valuable to themselves. Despite the conditions, not a monthly meeting has been omitted during the past year, and the attendance has varied from 40 to 60. The summer outing at Cedar Point, Ohio, in August was a disappointment in respect to attendance, due to the conditions of the trade.

The other important department of our work is the bulletin and information service, which, I hope, the members find of value and will provide the funds to continue it. The principal point we have to face is that our fixed income from dues is too small to carry on the kind of work we are attempting. Our plan to ask our regular members to pay to the Association a fee of 3 cents per 100 pounds on crude rubber purchased by them since July 1, 1920, fell through, as only 15 of our regular members agreed to the plan and as a matter of fact very little crude rubber has been purchased by any manufacturer since the time mentioned. We need a permanent plan of finance if the work of the Association is to be continued along present lines. We should try to raise a sum not less than $15,000 annually. Evidently this must be done by increased subscriptions among our present members and additional efforts to increase the membership.

After the adjournment of the annual meeting the newly elected directors met and elected officers, as follows:

PRESIDENT

D. M. Mason, general manager, The Mason Tire & Rubber Co., Kent, Ohio.

FIRST VICE-PRESIDENT

W. W. Wuchter, general manager, Nebraska Tire & Rubber Co., Omaha, Nebraska.

SECOND VICE-PRESIDENT

M. J. Flynn, treasurer, Inland Rubber Co., Chicago, Illinois.

TREASURER

George B. Dryden, president, Dryden Rubber Co., Chicago, Illinois.

SECRETARY AND GENERAL MANAGER

Harry S. Vorhis, 332 South Michigan Avenue, Chicago, Illinois.

Special committees were appointed as follows:

COMMITTEE ON COÖPERATION

S. P. Woodard, CHAIRMAN, Gillette Rubber Co., Eau Claire, Wisconsin.
Ashton W. Caney, Achilles Rubber & Tire Co., Binghamton, New York.
John W. Maguire, The Portage Rubber Co., Akron, Ohio.
W. G. Brown, The Consulting Co., Cincinnati, Ohio.
Wesley E. Wilson, Akron Rubber Mold & Machine Co., Akron, Ohio.
W. E. Myers, Denman-Myers Cord Tire Co., Cleveland, Ohio.
William L. Burgess, Surety Tire & Rubber Co., St. Louis, Missouri.

WAYS AND MEANS COMMITTEE

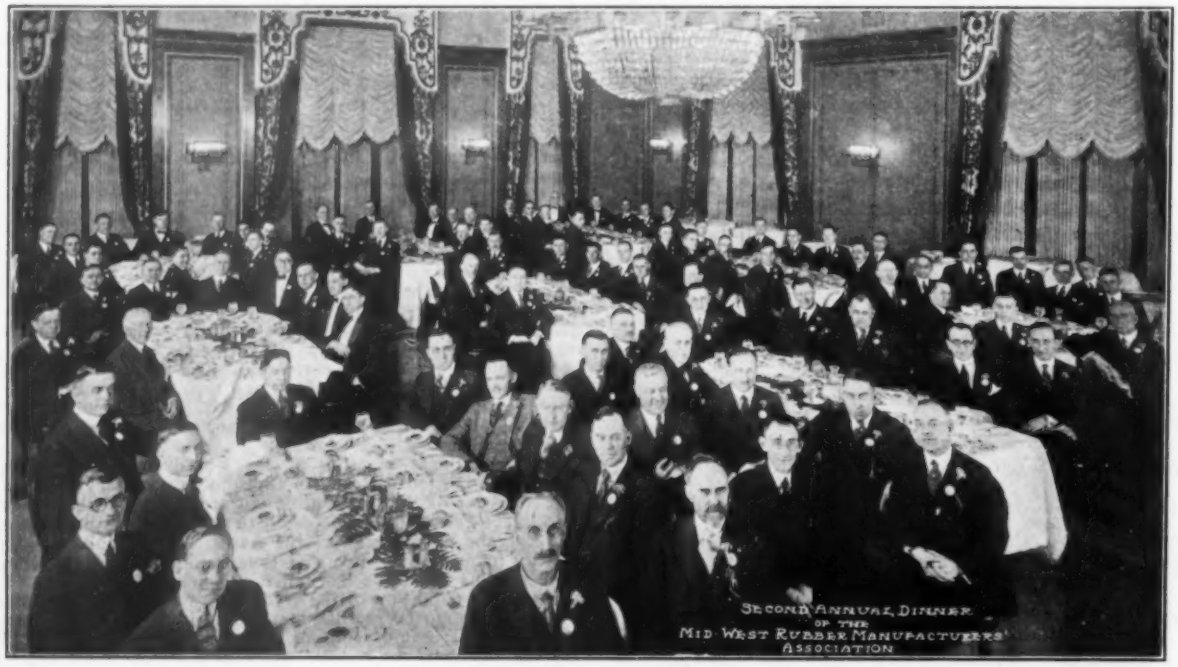
John T. Christie, CHAIRMAN, Hawkeye Tire & Rubber Co., Des Moines, Iowa.
Edward E. Allen, Allen Machine Co., Erie, Pennsylvania.
Stanley W. Harris, Akron Rubber Mold & Machine Co., Akron, Ohio.
T. M. Gardner, Brighton Mills, Inc., Passaic, New Jersey.
T. J. Carroll, Brunswick-Balke-Collender Co., Chicago, Illinois.
Paul A. Bloom, Fred Stern & Co., Chicago, Illinois.
Charles F. Sawyer, Sioux City Tire & Rubber Manufacturing Co., Sioux City, Iowa.

COMMITTEE ON RESEARCH AND STATISTICS

Ole Hibner, CHAIRMAN, Cleveland Rubber Corporation Co., Cleveland, Ohio.
W. F. Harrah, National-Standard Co., Niles, Michigan.
Edward T. Meyer, F. R. Henderson & Co., Chicago, Illinois.
P. E. Finlay, Bibb Manufacturing Co., Macon, Georgia.
J. Matthias, Jr., Mineral Point Zinc Co., Chicago, Illinois.
E. S. Babcox, *India Rubber Review*, Akron, Ohio.
Robert Wishnick, Wishnick-Tumpeer Chemical Co., Chicago, Illinois.

CREDIT COMMITTEE

J. E. Grady, CHAIRMAN, Archer Tire & Rubber Co., Minneapolis, Minnesota, together with representatives from the following companies: Gillette Rubber Co., Brunswick-Balke-Collender Co., The Mason Tire & Rubber Co., The Portage Rubber Co.

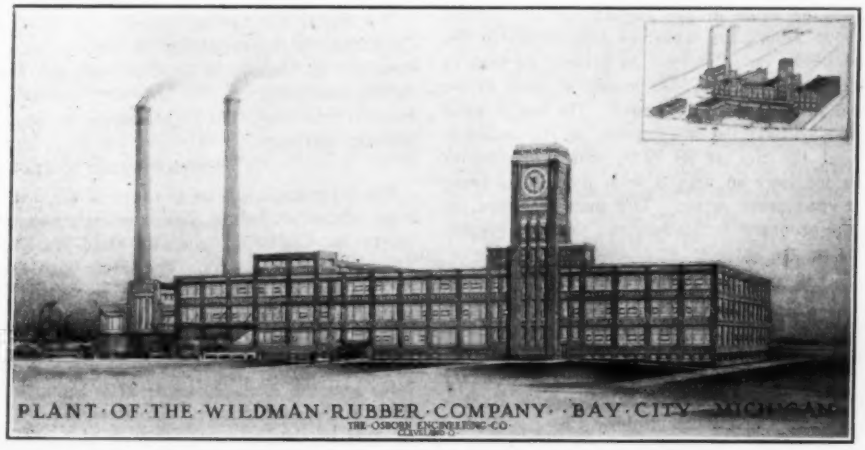


SECOND ANNUAL BANQUET OF THE MID-WEST RUBBER MANUFACTURERS' ASSOCIATION, HELD AT THE CHICAGO ATHLETIC ASSOCIATION, DECEMBER 14, 1920.

Model Plant of The Wildman Rubber Co.

AN industrial plant that embodies the latest developments in tire factory construction is that of The Wildman Rubber Co. at Bay City, Michigan. Every problem relating to routing of material and product has been intelligently considered and the buildings when completed will permit the most efficient operations in tire making. All the buildings will be strictly fireproof and in addition will be equipped with sprinkler systems.

The main building will be 365 feet long by 160 feet wide, built of reinforced concrete with brick facing, asphalt mastic floors and composition roof, and will consist of three stories and basement. The basement and first floors will cover the entire area above mentioned, while the second and third floors will be composed of a main connecting building with three wings pointing south, thus making the building look somewhat like a large capital E. The entire building will be lighted by modern type of steel sash and saw-tooth skylights. Entrances, toilets, stairways, elevators and such utilities will be grouped at two points in the main wing of the building.



The basement of the easterly wing will be used for washing, drying and storing crude rubber. The basement of the balance of the building will be utilized for machine shops, pipe shops, electrical shops, carpenter shops, etc.

The main floor of the building will be devoted to the major preliminary operations in the manufacture of automobile tires. Here will be located two lines of four mixing mills, each placed under saw-tooth skylights between the easterly and middle wings. In a similar position between the westerly and middle wings will be located the tubing machines, calenders and warming mills.

The first floor of the westerly wing will be used for fabric storage and the handling, cleaning and rerolling of calendered liners. On the second floor of the easterly wing will be the finishing department where the finished tires will be finally inspected, buffed, wrapped and prepared for shipment. In the middle wing will be located the compound room and the storage for compounds, while the westerly wing will be entirely occupied by the manufacture of inner tubes.

On the third floor in the westerly wing stock will be received from the calenders and tubing machines and cut and prepared for the tire builders, located in the middle wing on the same floor. Here the tire building machines will perform the earlier operations in tire building, followed by finishing operations on finishing wheels. The tires will then be passed by automatic carriers into the easterly wing to the heaters that will be located in a manner to facilitate operation, singly or in groups, and also later permit the use of automatic equipment.

Over the calenders, mills and heaters will be placed electric traveling cranes to facilitate installation, repairing when necessary and handling of materials to and from the machines.

Following the manufacturing processes from raw materials to finished product, all raw materials will be received at the first floor in the easterly wing, which will be used as a receiving and shipping room. The crude rubber will be prepared for compounding in the basement of the easterly wing, thence elevated to the first floor, where it will be compounded and mixed on the mixing mills. The compounds stored on the second floor will be dried and sifted when necessary, and placed in bins provided with chutes for delivering the various ingredients to the compounding room on the floor below.

Leaving the mixing mills, the batches will pass into a small storage room to await their turn in the calender room, where they will be kneaded to the proper consistency on the warming mills. Here the various types of rubberized fabrics and the rubber sheets for side wall, inner tubes and other stock will be calendered. From the calenders the tube stock will be elevated to the second floor in the westerly wing, which will contain complete equipment and machinery for the manufacture of inner tubes. All stock from the calenders required for the tires will be elevated to the third floor. The tread stock, having been warmed, will pass through tubing machines and thence elevated directly to the middle wing of the second floor. Other stock will be passed to the westerly wing of the third floor, there to pass through bias cutters, stripping machines, etc., and thus be prepared on reels or in books ready for the tire building machines.

From this point all of the product will pass easterly through the middle wing, where the tires are built, to the easterly wing, where the tires will be cured, stripped from their cores and dropped to the second floor for finishing, as above described. Automatic carriers provide for the handling of materials and the movement of the unfinished product from one department to another.

The building as laid out will have a capacity of 2,500 to 3,000 finished tires and tubes per day, and its construction will permit increasing the capacity without interfering with the operations of the various departments.

Immediately east of the main building will be located the boiler plant, consisting of a modern boiler installation, with pumps, accumulators, air compressors, etc., to provide steam and hydraulic pressure for tire building and for heating the buildings. All machinery will be operated by electric power. Service and employment and executive buildings as well as reclaiming and fabric plants are all included in the future aims of the company and may be constructed as its business requires. The company has an ample acreage of land for future expansion.

RUBBER FEET ON THE "KLERADESK"

A time-saving upright desk file is called the "Kleradesk." It is made of sheet steel, in interlocking sections, handsomely enameled, and is equipped with highest quality patent solid-rubber feet so no metal can scratch the desk. Its use obviates unsightly wire baskets and metal trays, and its simple system of filing promotes efficiency.—Ross-Gould List & Letter Co., Tenth and Olive streets, St. Louis, Missouri. New York representative, Condon Sales Co., 200 Fifth avenue, New York City.

THE RUBBER TRADE ON THE PACIFIC COAST

By Our Regular Correspondent

RUBBER MANUFACTURERS on the Pacific Coast from Seattle to San Diego do not share the pessimism of many in the same line in the East and Mid-West. Most of them regard the slowing down in the industry as quite natural after a too rapid expansion, and very few are said to hold large surplus stocks that may necessitate much price reduction to sell them. Trade reports are that there was very little, if any, overloading with raw rubber or fabric at the high prices prevailing early in 1920. To a few of the smaller concerns a lack of ample capital proved a blessing in disguise, otherwise they might have been tempted to overstock with raw material when it was much dearer. Inquiries for quotations on tires, tire repair stocks, belting, and miscellaneous rubber goods are steadily growing more numerous, indicating, as the manufacturers say, an early and active revival of business. Stocks of retail dealers are said to be exceptionally low for this season of the year.

A strong effort will be made at the January session of the California legislature to secure the repeal or amendment of the law requiring motor trucks on solid tires to present an inch in width of tire surface to the road per 800 pounds of load, at the point where the tire is in contact with the road. The law in most states requires that the load carried be computed on the measurement of the width of the tire at its base, which automotive engineers declare to be more in accord with the efforts being made everywhere at road preservation. Tire manufacturers are much interested in the proposed legislation, and they are preparing considerable data on the subject.

LOS ANGELES NOTES

A new sales branch has been opened at 1232 South Grand avenue, Los Angeles, by The Mason Tire & Rubber Co., Kent, Ohio, in charge of J. W. McCoy associated with M. W. Mitchell. Mr. McCoy was formerly assistant district manager of the northwestern territory for The B. F. Goodrich Rubber Co. and coast manager for the Portage Rubber Co.

The Goodyear Tire & Rubber Co. of California, Los Angeles, announces a reduction in prices of both fabric and cord tires, and also tubes, effective November 15. It ranges from 7½ per cent on straight side cord tires to 15 per cent on tubes. A 10 per cent cut in the price of solid truck tires was made October 29.

A. F. Osterloh, vice-president and general manager of the Goodyear Tire & Rubber Co. of California, states that the company is looking forward to a very prosperous new year. Despite a general slowing down in business throughout the country, the Goodyear California concern increased its gross business from $15,000,000 in 1919 to $17,000,000 for the fiscal year ended October 31, 1920. In the twelve western states comprising the company's territory there are 5,420 Goodyear service stations selling its tires and tubes.

The Lobel punctureless tire, which the inventor, N. Lobel, has just perfected, will be manufactured in Michigan, Ohio, New York, Missouri and Texas on a royalty basis. The general offices in Los Angeles are at 504 Mason Building, G. W. Cochrane being in charge, and from this source dealers in New England and abroad are being supplied.

The new headquarters of the Western Auto Electric Corporation at Sixteenth and Hope streets, Los Angeles, has been recently opened for sales and service for Willard batteries. A. J. Tobey is president of the concern.

John F. Scanlon, advertising manager of the United States Compression Inner Tube Co., which is making rapid progress with its plant at Burbank, near Los Angeles, has been recalled to the company's home plant at Tulsa, Oklahoma. The company plans to supply eight western states, the Orient, New Zealand, Australia and part of South America from its Burbank plant.

Los Angeles interests identified with the Southwest cotton-growing industry are renewing their efforts to have the city designated as one of the spot cotton markets of the United States by the Secretary of Agriculture. The city claims to be the natural cotton market in Southern California, Arizona, New Mexico, and large areas in Texas; that it is a concentration point, a port of export, has ample banking facilities, fair transportation rates, and a municipal high density baling press.

SAN FRANCISCO NOTES

A particularly good demand for rubber belting is reported by the Pioneer Rubber Works, San Francisco, which is still enlarging its plant at Pittsburg, Contra Costa County. Several heavy belting presses have just been installed. Some of the departments are working 24 hours a day. Many of the products are considerably oversold. The company has just received an order for 17,000 feet of heavy fire hose for Los Angeles.

The Seibel Air Spring Co., 785 Market street, San Francisco, California, is contemplating the construction of a new plant at San Mateo, California. Officers of the company are: Henry Seibel, president; A. W. McNulty, vice-president; C. A. Shelhamer, treasurer; W. F. Gormley, assistant treasurer; E. M. Massey, secretary.

SOUTHWESTERN NOTES

The long-staple cotton growers of the Salt River Valley, Arizona, whose product is almost entirely supplied to tire manufacturers in California and the Mid-West, are being liberally financed by local banks. The latter have loaned over $9,000,000 on this season's crop.

Business is reported unusually good by the Spreckels "Savage" Tire Co., of San Diego, despite the dullness in tire trade of the country. Practically no changes have been made in the working force and the management is anticipating a marked increase in sales in the near future. Social welfare of workers is strongly stressed by the "Savage" concern, and labor troubles are a negligible quantity at the big tire works.

Tire dealers on the Coast report a marked improvement in sales and inquiries following the recent reduction in prices, and state that when automobile owners are satisfied that no further reductions will be made the market will quickly stabilize and active buying follow. J. M. Magee, general manager for the Southern California and Arizona branches of the United States Rubber Co., believes there will be a lively demand for standard tires on the coast during the early spring, and it is possible there may be a shortage.

C. C. Gumm has been appointed receiver of the Hibbs Rubber Co., Fort Worth, Texas, manufacturer of tire-building machinery, dating from December 9, 1920.

The Good-Wear Tire & Belt Co., 322 Bedell Building, San Antonio, Texas, has purchased a 25-acre factory site five miles south of that city, and expects to begin the erection of the first unit of its plant before the end of the year. The factory will produce rubber goods entirely, including a patent harness tug and a patent fan belt. H. L. Fullerton is president of the company.

The Miller Rubber Company, Akron, Ohio, has appointed J. L. Adams manager of its branch at Houston, Texas, and L. Crain manager of its San Antonio branch in the same state.

NORTHWESTERN NOTES

The Victory Rubber Co., 646 New York Block, Seattle, Washington, is officered by George P. Endert, president; Dr. Carl Hoffman, vice-president; H. C. Eagles, secretary-treasurer. The factory operated by the company at East 38th and Brooklyn streets, Seattle, will enter into the productive stage about the first of the year, manufacturing mechanical rubber goods, in-

cluding soles and heels, silent floor tiling, contractors' sundries, etc.

The Olympic Tire & Rubber Co. manufacturer of tires and tubes, has offices at 217 Lyon Building, Seattle, Washington. R. G. Nelson, who is president of the company, is also president of the Olympic Textile Corporation with offices at the same address.

A sales branch of The Mason Tire & Rubber Co., Kent, Ohio, was opened November 1 at 82 North Broadway, Portland, Oregon, in charge of Catlin L. Wolfard, John M. Bruhn and J. H. Callahan.

The New York Belting & Packing Co. recently opened an office at 313 Felt Building, Salt Lake City, Utah, with a warehouse adjacent in which is carried a complete line of mechanical rubber goods. This office will be in charge of George N. Le Roux, who has sold this line of goods for eighteen years, starting as a Chicago city salesman. For the last ten years he has specialized in selling the mining industry.

Pacific Coast distributers of Racine tires have recently been in conference with the executives of the Racine Rubber Co. at Racine, Wisconsin. There they were advised of the company's intention to open on December 15 a large addition to the plant and to make a considerable increase in the operating force on January 1. The Pacific Coast agents say their surplus stocks are quite cleaned up, and they are concerned most about getting enough tires to meet the large demand expected within a month or two.

CANADIAN NOTES

THE Oak Tire & Rubber Co., Limited, has removed from 19 Dundas street to 258 Victoria street, Toronto, Ontario. At a recent meeting of the company the capital stock was increased from $400,000 to $2,000,000, half preferred and half common. A stock dividend of 100 per cent was paid to the old shareholders in addition to the usual cash dividend of 6 per cent, which has now been increased to 8 per cent. Frank Law, managing director, reports that $250,000 of the new 8 per cent stock is now being sold, the proceeds of which will be devoted to extending the company's plant and providing a larger working capital. Sales for the first ten months of 1920 are said to have been more than double the sales for the entire year of 1919.

V. O. Phillips & Sons, Limited, Kitchener, Ontario, manufacturer of garage equipment, air compressors, retreading and vulcanizing equipment, etc., have taken over the manufacturing rights in Canada of the "Dri-Kure" tire repair equipment formerly manufactured only in the United States by the Western Vulcanizer Manufacturing Co., Chicago, Illinois. The officers of the Phillips company are: V. O. Phillips, president and general manager, and H. M. Phillips, secretary and treasurer.

THE RUBBER INDUSTRY OF CANADA

Canada has not only become "self-supporting" as far as articles manufactured of rubber are concerned but the export trade in rubber articles of the Dominion has greatly increased in the last five years. This is a natural development in view of the fact that the total capital invested in the Canadian rubber industry amounts to $42,787,594. Of this sum $33,005,888 is found in Ontario, which is the center of the industry and boasts of 18 plants producing miscellaneous rubber goods, and 5 turning out rubber boots and shoes. Quebec has 3 plants producing rubber goods and 5 in the rubber boot and shoe industry, supported by capital amounting to $9,763,333. British Columbia's one rubber plant produces miscellaneous rubber goods, representing an investment of $18,373.

Canada's rubber industry furnishes employment for 12,677 persons, with 9,334 men and 3,343 women workers. Rubber goods plants employ 6,835, rubber boot and shoe factories, 5,842. The wages paid during 1919 totaled $11,547,817, of which $7,004,028 was paid to rubber goods employes and $4,543,789 to rubber boot and shoe makers.

The cost at the works of materials used during 1919 in the rubber goods factories is returned as $19,671,453, while the value at the works of rubber goods produced during the year is given as $38,651,640; similar figures for the rubber boot and shoe factories give costs as $7,862,961 and products valued at $19,351,794.

The increase in exports of Canadian rubber products is an index to the vitality of the Dominion's rubber industry. In the fiscal year 1914-15 rubber exports were valued at $722,905; 1915-16, $3,081,874; 1916-17, $2,911,505; 1918-19, $5,829,590; 1919-20, $10,069,963. In the last mentioned year tires to the value of $7,391,777 were included in the exports, of which $3,547,601 went to the United Kingdom.

THE RUBBER ASSOCIATION OF CANADA

A new organization of Canadian rubber manufacturers known as The Rubber Association of Canada has been organized during the past year, its scope and plan of operation being similar to those of The Rubber Association of America.

Its authority lies in a charter issued by the Canadian Government, March 17, 1920, the association being incorporated under the provisions of the Canadian Joint Stock Companies Act, without share capital. Organization did not really begin, however, until early in May, but so effectively has it been carried out that all the rubber manufacturers of Canada are now included in the active membership.

The by-laws authorize four classes of membership, viz., firm, associate, affiliated and honorary. Committees and divisions have been created to serve the special interests of members in transportation, legislation, foreign relations, industrial relations, as well as in questions relating to the manufacture of tires, footwear, mechanical goods, heels and soles, druggists' sundries, proofing and insulated wire.

The officers are: president, C. H. Carlisle, managing director of the Goodyear Tire & Rubber Co. of Canada, Limited; vice-president, A. D. Thornton, director of the Canadian Consolidated Rubber Co., Limited; treasurer, C. N. Candee, managing director of Gutta Percha & Rubber, Limited, Canada; assistant treasurer, John Westren, managing director of the Dunlop Tire & Rubber Goods Co., Limited, Canada. The directors are the foregoing with W. H. Miner, managing director of the Miner Rubber Co., Limited; F. E. Partridge, head of the F. E. Partridge Rubber Co., Limited; and Victor van der Linde, of the Van der Linde Rubber Co., Limited. The manager and secretary is A. B. Hannay, for many years a member of the Parliamentary Press Gallery of Canada at Ottawa. Offices have been established at 808 Royal Bank Building, Toronto.

Many Canadian firms are members of The Rubber Association of America, but owing to the growth of rubber manufacturing in Canada and to the fact that Dominion companies operate under different laws and tariffs, and have to meet special transportation, production, financial and marketing conditions, an independent Canadian organization became desirable.

SANITARY PACKAGES OF TOYS AND BALLOONS

Parents who hesitate to buy their children the rubber toys and balloons hawked about in the dust of street or store will welcome the "Faultless" sanitary balloon or toy packages which have recently been placed on the market. The contents of these packages of rubber toys and balloons are not touched from factory to child, thus eliminating many sources of contamination and possible disease. The balloons are sealed in transparent envelopes; the toys come assorted in three sizes of boxes, to retail at different prices according to size. To dealers each box represents a unit of sale that is easily checked up, stocked, displayed and sold.—The Faultless Rubber Co., Ashland, Ohio.

The Rubber Trade in Great Britian

By Our Regular Correspondent

THE COAL STRIKE duly came to an end without, except in a few cases, having caused any serious dislocation in the rubber industry. Trade, especially in the proofing department and in the making-up of garments, is quiet, almost to stagnation, and a good deal of short time is being worked.

Next to shilling a pound rubber, a prominent topic of conversation is the tightness of money. Leading firms with regular weekly pay days are now asking for a month's grace, and all around one hears of the difficulty of collecting accounts; a state of affairs which is accentuated by the chariness of the banks in granting loans. Naturally, the names of various firms get hawked about as likely to find themselves in trouble, and altogether the Christmas outlook is not particularly cheerful. The scarcity of money is attributed by many to the excess profits tax, but probably there are many other factors of equal, if not more importance.

Cessation of buying on the part of the public has proved a serious setback to trade, and now that in certain branches of trade, such as clothes and boots, prices have come tumbling down owing to forced realization, there is a tendency to wait until everything else comes down. It is a subject of comment, that while some noted tire firms advertised a cut in price to follow the fall in rubber, others have made no reduction. Another item which has caused comment is that masticated hard Pará rubber is quoted at 6*s*. 6*d*. per pound, which is 2*s*. more than four years ago.

From what I hear, the November motor show in London has not been a success financially, from the exhibitor's point of view, as sales were few and far between; indeed, some of the exhibitors' staffs were sent home before the end of the show. General tightness of money is the explanation of the slump in buying, and doubtless this is correct.

THE PEACHEY VULCANIZATION PROCESS

The statutory meeting of the Peachey Process Co., Limited, was held in London on October 25. The chairman, Sir John Hewett, K.C.S.I., presided. From statements made by A. Herring-Shaw, one of the directors, it appears that the experimental laboratory is being established in London, and not in Manchester, as was originally proposed. Mr. Peachey has given up his post of lecturer at the Manchester Municipal College of Technology, and will take charge of the London laboratory. It does not appear to be the purpose of the company to manufacture any articles for sale, but merely to demonstrate the manufacture of various articles on a working scale, and to issue licenses to manufacturers. As no patents had yet been granted in foreign countries, nothing could be said at the moment regarding foreign rights.

Last March Mr. Peachey was to have read a paper descriptive of his process at the Manchester section of the Society of Chemical Industry, but for obvious reasons found himself unable to do so. The paper was, however, given at the meeting of November 5, with the name of A. Skipsey added as joint author. Naturally, in the interval, the subject matter has lost a good deal of its novelty as far as readers of the rubber technical press are concerned, though the large attendance at the meeting showed that those outside the fold were anxious to get some first-hand information. Under the circumstances it does not seem necessary to quote the paper at any length, the opinions of the author elicited in the discussion being probably of greater interest.

H. L. Terry said that a piece of cut sheet rubber in his possession had been cured by the process six months ago, and showed no signs of deterioration. So far, he knew of no rapid test to replace the tedious aging test of time, though he was hopeful that something useful would result from the attention being paid to the matter by the Rubber Section of the American Chemical Society. As caustic alkali removed nothing but a little free sulphur, it was evident that reclaimers must look upon this cold cured rubber as similar to the ordinary hot sulphur cured rubber, and not as similar to the ordinary cold cured rubber in which the ready removal of the chlorine by alkalies left a practically soluble rubber.

A question was put by F. J. S. Gray, of the St. Helens Cable & Rubber Co., as to how the process was to be applied to solid tires and solid goods in general, the reply being that solid goods would be built up of vulcanized sheets, although in somewhat heavily compounded rubbers there was a very good penetration of the gases. As regarded solid tires, referred to also by other speakers, he might say that they would probably be the last rubber goods to tackle. It was too much, he said, to expect of a new process that it should be able to supplant older processes in every direction. The speaker, who said that he had tried the process and had found that sulphuric acid was produced, was informed by Mr. Peachey that he had evidently not carried out the process properly. There should always be an excess of hydrogen sulphide, and this would prevent oxidation of the sulphur dioxide.

Asked as to the effect of the free sulphur, which was a normal constituent of golden sulphide of antimony and ultramarine, Mr. Peachey said that free sulphur was undesirable, and bodies containing it would not be used in his manufactures. There was always a little free sulphur produced, but, by careful working, the amount could be kept very low. The sulphur which caused the rapid cure in the cold was in the atomic form and no doubt any free sulphur would be in the molecular condition. The question as to what was the effect of the water produced in the gaseous reaction was answered to the effect that the amount was very small and that it dissipated as a mist without condensing to water.

Among the exhibits on the table were samples of reformed leather for shoe soles, upholstery, etc., and floor coverings made of wood, meal, cork, etc., vulcanized with rubber as a binding, or a binding agent. A complete galosh made by the process was also shown. The vulcanized rubber and leather dust soles had been shown in practice to have two and a half times the wearing power of new leather, this being probably due to the greater resiliency.

SHALE NAPHTHA

In the October issue of THE INDIA RUBBER WORLD appeared an interesting editorial entitled "Solvent Naphtha from Oil Shale." It is interesting to hear the claims of American oil shale urged, and on grounds of ascertained cost, which may, of course, prove in practice to be exceeded. It is noteworthy that, although shale spirit has been used in Scotland for thirty or forty years, it is only to a limited extent. In England its use has generally been at times when the ordinary solvent was difficult to obtain. This is as regards proofing works. For one or two purposes in the mechanical branch, where balata is used, it has been preferred to solvent naphtha. In shale products sulphur is always the bugbear, and in the old days if one were anywhere near a Scotch proofing works, the smell of shale naphtha could always be detected if it were being used. Of late years, however, a great improvement has been made in the quality of shale naphtha, not only as regards smell, but also in freedom from high boiling constituents. A year or two ago the writer had the opportunity of inspecting the works of the Pumpherston Oil Co., Midlothian, and, on inquiring about shale naphtha, he was told that there was not much for sale, as it was going for motor spirit. Of course, if the large and progressive rubber companies of America do take to distilling oil shale, as the editorial suggests, they will be

able to prevent its application as motor spirit, otherwise the supply may fail if there is dependence on distilling companies outside the rubber trade. Probably the Americans before embarking on their shale distillation scheme in Colorado and Utah will note what success attends the company now developing oil shale fields in Norfolk.

THE RUBBER TRADE IN EUROPE

By a Special Correspondent

THE rubber sole business has experienced considerable activity during the last few months and promises to be as important and profitable as rubber heels.

Before the war few rubber soles were sold in Europe owing to the low price of leather soles. During the war, however, the shortage of leather changed the situation in favor of the rubber sole.

The soles made during the war were mostly inferior owing to the lack of good materials, which detracted from the reputation of the rubber sole and it has taken some time to regain the confidence of the buyer with the better quality of soles now being manufactured.

Much of the revival of this business is due to the improved methods of manufacture. Formerly each sole had to be cut to size by the boot maker, which required much time. Now they are supplied in a variety of sizes that can easily be applied to every form of shoe. In Germany the soles are packed two in an envelope including the nails for attaching them to the shoes, and are sold not only to shoe repairers but to general stores.

BRITISH NOTES

In accordance with the contemplated change of name of Explosives Trades Limited, noted in our issue of October 1, 1920, this British concern has become Nobel Industries, Limited.

The American consulate at Swansea, Wales, keeps a file of American trade catalogs for the benefit of local inquiries, and requests American firms dealing in raincoats and druggists' supplies to send their latest catalogs, and also, where possible, price lists and trade discounts. These latter are important, even though they be only approximate.

FRANCE

The Office du Commerce Exterieur, Paris, France, has recently been reorganized on a more ambitious scale. This department is a practical link between official France and the general public at home and abroad, aided by the new Foreign Commerce Bank. It controls the service of French commercial agents, and is responsible for organizing trade exhibits in France and other countries.

The department supplies trade information in the form of loose-leaf pamphlets, responds to verbal and written inquiries, and helps foreign traders seeking information as to the French market. The publication of a periodical similar to the British *Board of Trade Journal* will soon be begun.

The commercial exhibition plans include a "touring fair" for Canada, the Colonial exhibition at Marseilles in 1922, and an inter-allied exhibition to be held in Paris in 1925. Permanent exhibitions are being provided for branch offices of the department in the principal countries of the world, and have already been opened in Spain, Switzerland, Czecho-Slovakia, the Balkan States and in London.

HOLLAND

The Dutch rubber trade was fairly satisfactory last summer and the sales of most rubber goods have been better than expected under the circumstances. Mechanical goods have been in demand since the beginning of 1920 and a good business in druggists' sundries was reported. Exports suffered under the irregularities of the foreign exchanges, and manufacturers complain that many countries which in former years have bought rubber goods from Holland have issued import restrictions which make export to these countries difficult, while Holland itself is open to foreign competition in the same articles. The tire business increased materially during the Summer but it is severely handicapped by foreign competition. During the second quarter of 1920 exports of tires amounted to 556,000 florins while imports were valued at 3,265,000 florins. During the second quarter of 1920, 2,869,000 kilograms of plantation rubber were imported, 2,772,000 of which were from the Dutch East Indies. The export of plantation rubber during the same time amounted to 1,448,000 kilograms. Germany was the best customer, taking 759,000 kilograms, followed closely by the United States with 642,000 kilograms. Of balata, 7,608 kilograms were imported and 20,000 kilograms exported. The general situation of the industry has improved as compared with last year but complaints are still heard about irregularity in the supply of coal and supplementary materials.

At the Secondary Colonial Agricultural School, Deventer, Holland, a course in rubber has now been commenced. The director of this school, Dr. H. D. Tjeenk Willink, has been commissioned by the government to make a trip through Java and Sumatra during 1921, and subsequently to introduce into the curriculum, the information thus gained.

SPAIN

The quantity and value of imports of india rubber and gutta percha and manufactures imported into Spain during the years 1918 and 1919, are given in the following table. A peseta nominally equals $0.195 United States currency.

Articles	1918 Metric Tons	1918 Pesetas	1919 Metric Tons	1919 Pesetas
India rubber, gutta-percha, and substitutes, and manufactures of:				
Unmanufactured	842	5,474,661	3,765	24,471,050
Tires	132	2,568,127	709	18,830,589
Other manufactures	331	3,758,752	657	6,614,704

PORTUGAL

Imports of rubber and gutta percha manufactures into Portugal during 1919, together with chief countries of origin, are given in the following table, amounts being estimated in kilos of 2.2 pounds each and values in escudos, one escudo at par being $1.08 in United States currency:

Articles and chief countries of origin	Kilos	Escudos
Rubber and gutta percha manufactures	308,190	12,834,434
England	123,397	605,088
France	91,947	248,510
United States	48,932	232,758
Spain	30,852	130,675
Belgium	2,416	11,600
Oriental Africa	1,260	4,000
Germany	47	140
Wire, metallic (except gold, silver, or platinum) covered with rubber	208,208	324,353
United States	86,929	150,123
England	46,976	71,981
Spain	36,332	62,903
France	31,187	28,806

SWEDEN

The Helsingborgs Gummifabriks Aktiebolag at Helsingborg reports a total profit of 3,223,000 crowns and has distributed a dividend of 20 per cent. This is the best year ever had by this company.

A new firm has been founded in Stockholm for the distribution of rubber goods under the style Gummi-Engroslagerer Star, Herbert Carlson.

DENMARK

The United States Rubber Export Co., Limited, has opened offices in the Axelborg Building in Copenhagen. The building is a modern structure facing the railroad station.

The Oestasiatiske Industriog Plantagekompagni of Copenhagen which owns rubber plantations in the Malacca peninsula

has distributed a net profit of 8,410,000 crowns upon its capital of 20,000,000 crowns. This is a dividend of 40 per cent against the 25 per cent of last year. The company has 14,000 producing acres and obtained a harvest of 4,700,000 pounds of rubber, 800,000 pounds more than the previous year. The average price obtained was 2*s.* 1.06*d.*, with a production cost of 1*s.* 8.91*d.*

BELGIUM

The formation of a new company is under way in Brussels to deal in Brazilian rubber. The capital is said to be 30,000,000 francs.

GERMANY

The depression in German rubber industry continues unabated. There are few orders coming in and it has been necessary to lay off more men. Many factories are compelled to reduce working hours and in some cases only 12 hours are worked each week. According to reports of the Demobilization Commission there are now 419,000 men in Germany who receive full out-of-work compensation, which is a heavy increase against the last report. Most of the men out of work are unskilled laborers and the Trade Unions which comprise mostly highly skilled trades report less unemployment.

The Hamburg rubber market reacted sharply with the leading rubber markets of the world during the last few months and business was very irregular all through October and November. Forced sales in London had their effect upon Hamburg, where prices remained very weak but showed a strengthening tendency at the end of November when London sales became less frequent.

The sale of German army goods which is still proceeding has had a very depressing influence upon many branches of the rubber industry, especially the surgical goods trade. These sales lacked organization and goods were often marketed where there was little or no use for them. They were then sold at very low prices and sent elsewhere, swamping the market and causing a drop in retail prices. These army goods now seem to have come to an end, however; they have had their share in preventing profiteering.

Manufacturers and dealers in rubber hose have endeavored to keep prices but find it impossible and large sales have taken place during the last few months leading to considerable reduction in prices. The dealers blame the manufacturers for this condition.

The German industry apparently regards the intended nationalization of the coal mines as only a partial blessing. Former experience does not seem to justify the claims that are made on behalf of full nationalization. The principal objections are: National operation does not result in additional production; strikes are as frequent under national management; private management has the advantage of individual initiative. As the miners have a very great influence upon the conduct of governmental affairs it is almost certain that some attempt of nationalization will be made.

The Mitteland Gummiwerke Akt-Ges., Hanover, has increased its capital 300,000 marks. This step was taken to eliminate the danger of foreigners getting control of the management of the concern by buying up a majority share of the 4,500,000 marks of ordinary capital. To prevent this the new capital of 300,000 marks is issued in the form of preferential shares carrying a five times voting power.

The so-called Eastern Trading Fair which has taken place in Koenigsberg was more successful than the Leipzig fair, although it is not as important as the latter. The object of this fair was to create a trading center on German soil for Eastern Prussia, the free state of Danzig and the newly formed Baltic republics. Approximately 1,700 firms were represented, including a great number of rubber manufacturers.

The "hole in the West" is a source of considerable trouble to the German rubber industry, as many English and French tires are smuggled into Germany. To stop this practice the German Government has decided to make all foreign tires found in the possession of dealers and private users subject to confiscation. But the German tire industry is not quite satisfied that this expedient will work and therefore an appeal has been issued by the *Gummi-Zeitung* of Berlin to induce German tire users not to use foreign-made tires but to patronize German firms.

The German Belting Organization, in its market report for July and August, 1920, takes a bleak view of prevailing conditions. There is little demand for belting in Germany and many manufacturers have been compelled to sell stocks, which, together with similar sales by dealers, has had a very depressing influence upon the price situation. All price arrangements between manufacturers and dealers are breaking down.

The German cable industry has not prospered as might have been expected following the good beginning during the early part of past year. Orders have fallen off rapidly since the completion of reconstruction business and during the first half of the present year production has declined to approximately 30 per cent of the normal peace output. There are indications that the second half of the year will be even less satisfactory. The reason lies principally in the complete destruction of the German oversea cable business and in the lack of construction work in Germany. In view of the increase in the use of wireless telegraphy it is expected that Germany will not return to oversea cable service, which would mean a practical cessation of this part of the business of the German cable industry.

The rubber coat manufacturers of Germany have agreed to a new list of minimum prices and selling conditions. Credit terms, freight rates, payment for packages and similar other points have been regulated. The new terms apply from August 1.

A German manufacturer, the SB-Automobil-Gesellschaft m. b. H., 33 Sophienstrasse, Berlin, has recently put on the market a small one-passenger electric runabout, believed to be a novelty in the automobile field. A trailer for an additional passenger or for light delivery purposes can be attached. The car has a wheel base of 57.12 inches and a tread of 33.45 inches and weighs 440 pounds. The body is of wood with imitation leather upholstery. Electric current is furnished by two 24-volt lead-acid batteries permitting a speed up to 13 miles per hour. Wire wheels with clincher rims are employed, the tire size being 26 by 2½ inches. At the factory, a car of this type equipped with pneumatic tires can be purchased for 13,300 marks. Solid rubber tires bring the price up to 14,800 marks, while a trailer so equipped costs 4,500 marks. The company has produced and sold approximately 300 cars in the six months of its existence and claims an output of 100 cars a month at the present time.

The Gummiwerke Elbe A.-G. in Hamburg has increased its capital to 1,500,000 marks.

The Dunlop Rubber Co., Hanau-on-the-Main, has increased its capital to £2,000,000. A stock dividend of three shares for each existing share was distributed.

The Vereinigte Gummiwarenfabriken Harburg-Wien, Harburg-Wien, has issued a prospectus indicating a distribution of a 10 per cent dividend for the present year.

The Anhalter Gummiwerke has started a new factory in Zerbst.

NEW FIRMS

Gummi Handelsgesellschaft "Liga," Carl Peter & Co., Hamburg.

Auto Reifen Co., G. m. b. H. Konstanz. Dealer in tires.

Norddeutsche Gummiwaren Fabrikation, Erich H. Krause, Berlin.

Helga-Gummiabsatz-Compagnie G. m. b. H. Berlin. Manufacture and sale of rubber heels and similar articles.

Metropol-Gummi-Gesellschaft, Dortmund. Sale of rubber heels.

Sueddeutsche Gummi-Maentel Industrie Louis Kahn, Frankfurt-on-the-Main. Manufacture of rubber coats.

Hanowa, Gummiwaren-Fabrik A. C. Plötze & Co., Nowawes. Manufacture of rubber goods.

Gummiwerke Sterbfritz, Sterbfritz (Hessen-Nassau). Manufacture of rubber goods.

"Haguma" Hannoversche Gummi-Absatz-Fabrik G.m.b.H. Hildesheimerstrasse 144, Hanover, Manufacture and sale of rubber heels.

Gebr. Poersch Gummiwarenfabrik, Engelbostelerdamm 26, Hanover. Manufacture of rubber goods.

Wuertt. Gummiwarenmanufactur Anna Czeczowitzka, Heidenheim a. Br. To manufacture rubber goods.

Gummiwarenfabrik Berg Co., Hainstrasse 16, Leipzig. Manufacture of rubber goods.

Vogtlaendische Gummiwaren-Manufactur Emil Sengewald, Pausa. Manufacture of rubber goods.

Mettmanner Gummigesellschaft Schneider & Theuerkauf, Mettmann, Rheinland. Manufacture of rubber goods for shoe factories.

Gummi-Werke Rhenus Heinrich Stuemges, Rheydt, Bezirk Duesseldorf. Manufacture of rubber goods.

AUSTRIAN NOTES

The rubber industry was an important branch of the industrial life of Austria before the war, and during 1913 more than 5,000,000 pounds of rubber goods were consumed. The production was not only sufficient to supply the domestic market but considerable quantities of soft rubber goods were exported. There are four factories situated in the present-day German Austria which produce approximately three-fourths of the rubber goods formerly manufactured in Austria-Hungary. Until a few months ago the industry was very busy and sometimes unable to execute all orders, but recently new business has been noticeably lacking. Manufactured rubber goods are imported from Germany only in small quantities as export licenses are not easy to obtain and the Austrian government also is reticent in giving import licenses. The principal difficulty faced at the present time is lack of coal, benzol and other chemicals of which the supply is very small and which can be obtained only in small quantities.

The Semperit, Oestreichisch Amerikanische Gummiwerke-Akt.-Ges. in Vienna contemplates the increase of its capital from 16,000,000 crowns to 32,000,000 crowns. Nine million crowns of the new issue will be issued immediately.

RUBBER IMPORTS OF BRITISH SOUTH AFRICA

The year 1919 was one of undiminished prosperity for the Union of South Africa. There were unusually heavy imports of manufacturing machinery used in the production of india rubber goods. The following table shows the value of imports of rubber manufactures into the Union of South Africa during 1913, 1918 and 1919:

Articles	1913	1918	1919
Footwear, not leather	.....	$237,461	$333,983
Hose, conveying	$326,186	278,188	366,238
India rubber, and manufactures of	172,251	2,112,718	2,838,670

The principal countries of origin of rubber manufactures imported in the years mentioned, together with values, were:

Articles and Principal Countries of Origin	Value
Rubber boots and shoes	$295,691
United States	204,212
United Kingdom	67,017
Rubber tires	2,343,248
United Kingdom	964,000
United States	714,718
France	400,702
Canada	241,958
Italy	78,316
Rubber, other manufactures of, n.e.s.	420,255
United Kingdom	222,618
United States	154,015
Canada	23,021

FOREIGN TARIFFS

SPAIN

Effective December 1, 1920, the Spanish import duties on articles classed as luxuries will be materially increased. Duty on solid rubber tires with metallic mountings will be increased 150 per cent. An increase of 300 per cent will be made in the duty on manufactures of ebonite, also on rubber tires and inner tubes for carriages and other vehicles, and on rubber fabrics made into clothing.

PORTUGAL

According to the *Diaria do Governo* for November 12, 1920, Decree No. 7104 modifies the schedule of surtaxes applied to articles of luxury imported into Portugal, the duty on india rubber or gutta percha in waterproof or elastic silk fabrics being placed at one escudo per kilo (1 escudo equals $1.825; 1 kilo equals 2.2 pounds). Fabrics of silk combined with gutta percha or india rubber, made up into articles not specially mentioned are taxed at three escudos per kilo.

LATVIA

The Latvian Consulate, 162 West 31st street, New York City, announces the following tariff regulations concerning imports to Russia through the Latvian ports of Riga, Libou and Windou: The import duty on crude rubber is 5 per cent and rubber goods pay 15 per cent.

GUATEMALA

On and after January 1, 1921, radical changes are to be made in import duties on articles entering the republic of Guatemala, according to Decree No. 765 recently signed by President Herrera. By the provisions of this decree miscellaneous articles listed in section 14 will pay 100 per cent of the duty in gold. Section 14 includes manufactures of rubber and gutta percha and rubber boots and shoes.

PERU

The new Peruvian customs tariff which went into effect October 15, 1920, contains increases of duty on articles of rubber (Item No. 264). Soft rubber articles, including bicycle tires, formerly taxed at 1.50 sols per kilo (1 sol = $0.486; 1 kilo = 2.2 pounds), now pay a duty of 1.60 sols per kilo. Automobile tires, formerly dutiable at 1.00 sol per kilo, now are taxed 1.60 sols per kilo.

AMERICAN DRESS SHIELDS IN FRANCE

American manufacturers will find a market in France for many commodities, but it is important that the exporter should first ascertain the demand for his particular commodity, and also take into consideration the French import restrictions. A particular instance is a shipment of dress shields recently made by an American manufacturer. The American article is in considerable demand by French women when fashion makes them desirable. These dress shields, though substantially of rubber, are covered with silk. A composite article is dutiable in France, as in many other countries, at the highest tariff applying to any one of its components. In this case the silk came under the higher tariff, which was charged on the whole article by weight. But the American exporter had calculated the duty according to the tariff on rubber and therefore had to increase his price considerably. Under the present system of arriving at tariff charges such a mistake might mean considerable loss.

THE VALUE OF MANUFACTURED RUBBER GOODS IMPORTED INTO Hankow, China, during 1918 and 1919 is given in the following table:

Articles	1918	1919
Electrical materials:		
Wire, insulated and vulcanized	$49,387	$58,098
Garters and suspenders	536,273	232,153
Hose, canvas and rubber	16,551	18,046

The Rubber Trade in the Far East

By a Special Correspondent

THE STORAGE OF PLANTATION RUBBER

THE SLUMP in the rubber market and the rapid accumulation of stocks have raised the question of the possible effect storage for any prolonged period will have on crude rubber.

Owing to the lack of shipping space in 1918, the subject became one of commercial importance, and investigations were initiated by the Agricultural Department of the Federated Malay States. Numerous samples had been stored for periods varying up to five years, after parts of them had been vulcanized and tested, the results indicating that considerable deterioration results from storage in the tropics, especially in crêpe samples. This deterioration is attributed to surface oxidation.

A few old samples of stored slab rubber, containing about 15 per cent of moisture, showed that little or no deterioration had taken place. This was attributed to the presence of moisture and to the small amount of surface exposed to oxidation.

The tensile curves of stored samples are of a different type to their original ones, and resemble those of poor quality lower-grade rubber. Whether the effect is entirely due to oxidation or to a degradation of the caoutchouc molecule to another polymer requires investigation.

Another feature observed was that the rate of cure of samples after storage tends to even up. Fast-curing crêped samples tend to cure more slowly, while slow-curing crêpes generally cure more rapidly. Slab rubber, cured as such, did not show this feature. Until further investigations have been made, it is not possible to formulate definite theories as to the cause of the change.

Considerable interest has been shown in slab rubber, especially by several American manufacturers. Consignments of 2½ tons per fortnight for a period of three months were sent to one of the largest firms through the F. M. S. Agricultural Department, and excellent results were obtained. One interesting feature is that approximately 250 pounds of slab, representing about 212 pounds of dry rubber, could be packed in the same space as about 170 pounds of crêpe. The chief disadvantage is that slab rubber has to be crêped at the mills, where the cost of labor is higher than in the producing countries. Crêped slab requires more drying than rubber shipped dry, and so more drying space would be required.

The best method of preparing rubber of this type for shipment would be to convert the slab into thin worms, which would be dried, pressed into dry blocks, and so exported.

MALAYAN NOTES

At a recent meeting of the Federal Council, Federated Malay States, R. C. M. Kindersley asked whether land would be granted to Americans in the Federated Malay States, and if so what approximate acreage and what labor conditions would be attached to the grants. The answer was that no distinction between nationalities would be made except in the case of recent enemies of the British Empire. The area to be granted to any particular applicant depends upon several considerations, among others, being his financial ability to open up the acreage given him. As for labor, new rules are under consideration and if approved would be endorsed on all grants of over 200 acres of land.

The Association of British Malaya which takes the place of the old Straits Settlements Association, aims to consider all subjects of public interest in British Malaya, including rubber planting, mercantile interests, shipping and banking as well as the labor question and the welfare of the Malay population.

STRAITS SETTLEMENTS

The import trade of British Malaysia for the past two years reveals a growing market for automobiles, trucks, bicycles and all kinds of motor equipment. Rubber is one of the chief products of the country and the motor truck has become imperative in conveying it from the wharves to the stores, as sales frequently stipulate delivery within two days, which is impossible where ox-carts are employed. It is only within recent months that the motor truck has begun to displace the ox-cart and the coolie in transporting rubber, as the plantation owners have been slow to realize the saving in time and cost that might be effected by a wider use of the motor truck.

Rubber exports from the Straits Settlements during the first six months of the current year were 10,000 tons less than for the corresponding period last year. Rubber decreased in value from $0.50 per pound in January, 1920, to $0.37 in June and about $0.23 in September. At this latter figure a considerable proportion of the rubber growers produced at a loss. Telegraphic reports from London state that unless outputs are restricted there will be a surplus of 34,000 tons at the end of the year.

Imports and exports of inferior gutta and Pará rubber of the Straits Settlements for the quarter ended June 30, 1920, show considerable advance in the trade of the colony in these articles of commerce. Quantity is expressed in piculs of 133⅓ pounds and value is given in United States currency based on exchange at $0.50 (normal value of Straits dollar = $0.5677 United States currency).

	April-June			
	1919		1920	
	Piculs	Value	Piculs	Value
IMPORTS				
Gutta, inferior	50,904	$440,388	58,217	$625,831
Pará rubber	527,994	21,926,465	545,844	27,242,926
EXPORTS				
Gutta, inferior	35,134	$349,168	27,133	$613,196
Pará rubber	739,627	35,316,124	798,755	44,993,870

RUBBER PLANTATIONS IN BRITISH MALAYA

The following figures are official statistics of the rubber industry in British Malaya so far as they refer to estates of 100 acres and over in extent.

Dealing first with the Federated Malay States statistics to December 31 in each year, the following comparison is made between 1918 and 1919:

	1918	1919
Number of estates	1,126	1,221
Acreage in possession	1,094,217	1,167,043
Acreage planted	672,106	736,742
Acreage producing	447,175	490,372
Newly planted	50,484	64,636

Adding the above figures to the statistics for the Straits Settlements, Johore, Kelantan, Kedah and Trengganu, the totals are as follow:

	1918	1919
Number of estates	1,714	1,896
Acreage in possession	1,978,090	2,091,535
Acreage planted	1,124,243	1,236,806
Acreage producing	691,435	751,986
Newly planted	78,423	108,438

In 1919, the rubber crop in the Federated Malay States amounting to 73,684 tons as against 62,517 tons in 1918, and the figures for the whole of British Malaya over a period of ten years were as follows:

	tons		tons
1910	6,414	1915	51,885
1911	11,117	1916	67,677
1912	18,956	1917	82,319
1913	28,169	1918	92,279
1914	37,403	1919	106,757

These figures represent production, not export. The total export of plantation rubber from the Federated Malay States alone, according to the statistics of the Commissioner of Trade and Customs, amounted to 108,393 tons in 1919 as against 78,283 tons in 1918 and 79,831 tons in 1917. The discrepancy between

a rubber crop for the whole of British Malaya in 1919 of 106,757 tons and an export of 108,393 tons from the Federated Malay States alone may possibly be accounted for by the holding back of part of the previous year's crop owing to the lack of shipping facilities.

Upon estates of 100 acres and over in extent in the Federated Malay States there were 234,195 laborers employed. The composition of the labor force for the rubber estates of the whole of British Malaya was as follows:

	F. M. S.	Elsewhere	Total
Tamils	174,274	53,656	227,930
Chinese	39,871	31,602	71,473
Malays	10,733	15,400	26,133
Javanese	7,935	9,026	16,961
Others	1,382	1,444	2,826
Totals	234,195	111,128	345,323

THE F. M. S. RUBBER CO.

The annual report of the Federated Malay States Rubber Co., Limited, a Belgian concern operating in Malaya, shows that the company owns 7,630 acres of land, 4,690.51 acres of which are under old rubber, 536.56 newly planted and 31 acres cleared; 314.35 acres are devoted to buildings, etc., while the remainder is held in reserve. Since October, 1919, the company has gone over to the alternate-daily system of tapping and at present 4,665½ acres are being tapped on this system. The new method of tapping has resulted in decreased yields. The total crop was 1,588,123 pounds; the f. o. b. costs were 1*s.* 3½*d.*, against 10 9/10*d.* in the preceding year. This difference in costs was due to the decrease in crop. The company paid out total dividends amounting to 110 per cent.

CEYLON

The foreign trade of Ceylon for the six months ended June 30, 1920, shows a decrease of nearly 50 per cent in exports, one of the contributing causes being the decrease in exportations of rubber. This has been accompanied by a general slump in the prices of rubber. Though in September, 1919, rubber had reached a record price of 1.27 rupees Ceylon currency (normal rupee equals 32 cents United States currency), for best-grade crêpe, today's price is 0.067 rupee only. Producing estates have had to contend with increased production costs, which amount to as high as 0.15-rupee a pound. Shares in rubber estates are dropping rapidly and in some cases the Ceylon value of such stocks has already decreased by 50 per cent. The prevalent opinion among exporters is that rubber prices have not yet reached the lowest level.

RUBBER AREAS IN CEYLON

	Estates Over 15 Acres	Small Holdings	Total Acres
Acreage in rubber tapping, September 1, 1919	253,930	13,032	266,962
Acreage in rubber over 5 years of age but not in tapping, September 1, 1919	20,752	3,552	24,304
Acreage in rubber over 1 year and under 5 years of age not in tapping, September 1, 1919	61,416	20,875	82,291
Acreage of one-year-old rubber	13,392	10,945	24,337
Acreage of land cleared ready for planting	7,132	.....	7,132
Totals	356,622	48,404	405,026

On small holdings there are sometimes as many as 250 and more trees to an acre. The acreage has been taken as 200 trees per acre as some small holdings have been thinned out in accordance with estate practice.

Of the areas of over 15 acres, some belonged to planters' associations and others did not. Of the former class, the total acreage was 285,539 distributed over 21 planting districts of which the most important are: Galle, 23,858 acres; Kalutara, 52,197 acres; Kandy, 24,885 acres; Kegalle, 18,966½ acres; Kelani Valley, 50,734½ acres; Matale, 39,086 acres; Sabaragamuwa 27,973 acres. The total acreage of estates not members of associations was 71,083, distributed over 11 districts. The Ratnapura district had the highest total acreage, 19,017¼, but Kalutara had the highest acreage in tapping, 7,039½, although its total was but 7,039½ acres.

THE NETHERLAND EAST INDIES

The several things that are worrying Netherland Indies rubber producers are: additional taxes, the proposed change in the labor laws and the low price of rubber. The Netherland Government is considering a proposal to modify the budget for 1920, which would mean an increase in taxes for producers.

The International Association for Rubber Culture in the Netherland East Indies has protested, pointing out that the taxation policy will frighten away needed foreign capital. In fact, not long ago a foreign concern was ready to invest 50 million guilders in rubber plantations on the East Coast of Sumatra, but it backed out chiefly because of the Netherland East Indies' fiscal and general policy.

The proposed measures abolish the so-called "penal sanction" in the laws pertaining to coolie labor, by which "penal sanction" a coolie is bound over to an estate for a certain number of years and the employer has the right to force the coolie to fulfil such a contract and punish him if he fails to do so. The measures under consideration would be severe on Sumatra which has vast undeveloped areas of valuable land and a proportionately small indigenous population. Up to the present the opening up of the island has been made possible by the use of large numbers of indentured Javanese held to their work by the "penalties." The uncertainty of the present conditions is having a bad influence on private enterprises. It has been suggested that the government allow Palembang, Benkoelen and West Coast of Sumatra, 8 years and Tapanoeli, Atjeh, East Coast of Sumatra, Riouw and Djamhi at least another 13 years of this "penal sanction."

The extent of European and American enterprise in Sumatra and particularly Deli, may be gathered from the fact that while exports of rubber in 1914 were about 6,500,000 kilos, this rose to 32,120,000 kilos in 1919, and the estimated output for 1920 is about 42,000,000 kilos.

NEW ESTATES

It is reported that the Anglo-Dutch Plantations of Java, which received the sum of 17 million gilders from the Netherland East Indian Government for their privileged freehold property, have invested a portion of this money in the purchase of some 200,000 acres of land from the Sumatra Land Syndicate.

E. N. Cummins, manager of the Sungei Renching Rubber Co., is said to be in Sumatra at present for the purpose of investigating and reporting on the newly acquired land which, it appears, will be mainly planted to rubber. Only a part of the leasehold rights over the 200,000 acres has as yet been granted by the government. The value of these rights is estimated at fl. 10 per acre. The estates are situated in Bencarlen, Palembang and along the West Coast of Sumatra. The shares of the Sumatra Land Syndicate are held by Mr. Hammond, manager of the Anglo-Dutch Plantations.

CENTRAL RUBBER EXPERIMENT STATION

The new building for the Central Rubber Experiment Station, Buitenzorg, was recently opened. A number of officials and planters were present at the opening. It will be remembered that this experiment station was temporarily housed in the former foreigners' laboratorium in the botanical garden. The laboratorium soon became too small for the constantly growing activities of the station which now has a fine building of its own.

Dr. van Leeuwen, Ph.D., director of the Botanical Gardens at Buitenzorg, Java, is shortly to visit Malaya, Siam, Saigon, Japan, Honolulu and Manila in order to strengthen the relations of the Buitenzorg institutions with similar foreign institutions and to study the progress of botany and zoology in the countries mentioned.

RUBBER AREAS

Official statistics for 1919, regarding the areas devoted to different crops, show that in Java and Madura, 463 rubber

estates together have a planted area of 88,124 hectares (hectare equals 2½ acres), of which 59,613 acres are producing; the outside possessions gave figures of 351 rubber estates with a planted area of 174,712 hectares, of which 109,017 hectares are producing. This shows a total of 814 estates having a planted area of 262,836 hectares of which 168,630 hectares are producing.

THE NETHERLAND GOVERNMENT RUBBER PLANTATION

The Forestry Service of the Netherland East Indies has for a number of years been occupied with the cultivation of rubber-producing plants. In 1886 the first experiments were made with *Ficus elastica*, which is indigenous to Java, while in 1900 the cultivation of *Hevea brasiliensis* was begun. *Castilloa, Manihot* and *Funtumia* also received the necessary attention, but the cultivation of these was not continued after it was discovered that it could lead to no success in Java.

In 1910 the plantings of *Ficus* and *Hevea* had increased to such an extent that it was thought desirable to make separate rubber plantations, and in 1919 these were established apart from the Forestry Service. From the beginning only *Hevea* was planted, for the reason that *Ficus*, through its small production, had not turned out to be profitable. The planting of the latter, therefore, was gradually diminished. The industry now consists of 14 rubber plantations.

GUTTA PERCHA

Exports of gutta percha from Padang, Sumatra, during July, 1920, were 292 piculs (picul = 133 1/3 pounds). For the seven months from January 1 to July 31, 1920, the amount was 5,903 piculs, against 2,517 piculs for the corresponding period during 1919.

JAVA STATISTICS

IMPORTS OF AUTOMOBILE TIRES INTO JAVA

	August		Eight Months Ended August	
	1919	1920	1919	1920
From Great Britain ....number	140	916	4,270	7,246
France	1,382	3,665	33,216	16,560
Italy	.....	440	1,991	8,077
United States	5,251	7,212	35,952	47,710
Singapore	1,358	474	4,738	5,867
Japan	8,967	4,835	64,307	38,594
Australia } Elsewhere }	1,179	1,749	5,065	9,799
Totals	18,277	19,291	149,539	133,853

IMPORTS OF BICYCLE TIRES INTO JAVA

	August		Eight Months Ended August	
	1919	1920	1919	1920
From Holland ....number	.....	4,182	948	15,966
Great Britain	.....	590	441	2,287
United States	.....	1,002	3,276	4,074
Singapore	350	410	1,625	11,726
Japan	20,521	33,946	85,877	340,108
Elsewhere	.....	3,000	14,210	9,824
Totals	20,871	43,130	106,377	383,985

BRITISH NORTH BORNEO

The British North Borneo (Chartered) Co. has increased its area under cultivation from 40,986 acres to 47,739 acres and the amount of rubber exported was 3,000,000 pounds.

In June, 1920, 579,009 pounds of plantation rubber were shipped from North Borneo. Exports for the first half of 1920 were: 4,436,119 pounds, as against 4,158,979 pounds in the first half of 1919.

The Bolivian Rubber Industry[1]

THE RUBBER INDUSTRY of Bolivia, which is one of the most important in the republic, is centered in the Amazonian region and dates from the eighties, although the first rubber was taken out along the Mamoré in 1864. The years 1909 to 1911 were golden years for the Bolivian rubber industry, as during that period rubber reached the maximum price of $2.92 per pound. In 1917 the East Indian plantations began bearing and Amazonian rubber took second place in the world's markets, as far as quantity was concerned.

CHIEF RUBBER PRODUCING DISTRICTS

Rubber is found in the four northernmost departments of Bolivia—El Beni, La Paz, Cochabamba and Santa Cruz, and also in the territory of Colonias, which has become the most productive rubber region in the republic. Rubber trees are found in large numbers along all its rivers, including the Acre, Abuna, Orton, Madre de Dios, and their tributaries. The Beni district has steadily declined as its stock of trees has been worked out. Most of the *gomales* or rubber tree areas of this district are along the lower reaches of the Beni and the Mamoré, in the Province of Vaca Diez; there are also important fields in the Itenez basin. San Ignacio and Concepcion are the chief centers of the rubber business of Santa Cruz, the producing districts lying mostly between the San Miguel and the Paraguay rivers. The province of Caupolican is the center of the rubber industry of La Paz, while the comparatively unimportant *gomales* of Cochabamba are situated in the basins of the Chaparé and the D'Orbigny.

RUBBER PRODUCING TREES

Pará fine, the highest grade of Amazonian rubber, is derived from *Hevea brasiliensis*, a tree that grows from 90 to 120 feet in height, with a diameter that often exceeds three feet at the base. The caucho tree, *Castilloa ulei*, yields the inferior grade of rubber sold as caucho, while the rubber known as Ceará is extracted from the maniçoba tree, *Manihot glaziovii*. The caucho tree is generally cut down in order to obtain the latex, while the other varieties yield to tapping. Wild rubber trees do not exist in groves but are scattered through the forest. The areas along the rivers where they occur seldom extend inland more than 10 or 12 miles.

LEGISLATION

Bolivian legislation fixed the unit of rubber concessions as the *estrada* of 150 trees, with a limit of 500 *estradas* to individuals and 1,000 to legally constituted companies. This gave rise to such great abuses because of the scattered location of the trees that in 1905 a law was passed declaring the hectare (2.471 acres) the unit of land measurement, 75 hectares being allowed for each *estrada* by a law passed in 1917. Practically all the rubber-bearing lands of Bolivia are now included in grants to which the titles have been perfected or which are the subject of negotiations with the government. However, many holders of rubber lands have not complied with the requirements of the laws, consequently the government anticipates that on December 31, 1920 (the limit allowed by the law of October 31, 1917), it will have been required to reassume large tracts of land now occupied by the rubber companies.

IMPORTANT RUBBER INTERESTS

According to the report of Trade Commissioner Schurz, the most important of the rubber interests operating in Bolivia include the following:

[1]Commerce Reports, October 25, 1920.

Suarez Hermanos, the most powerful of all the Bolivian rubber companies, has its home offices in London and also has a receiving and forwarding station at Pará. The Bolivian headquarters of the Suarez interests are located at Cachuela Esperanza, a short distance above Villa Bella, on the Beni, at which point are large stores and warehouses. The rubber fields extend along the Beni to Riberalta and up the Madre de Dios to the Peruvian frontier. In addition the company has nearly 2,000,000 hectares on the Orton and its tributaries, besides large properties on the Acre and the Abuna. Altogether it possesses nearly 10,000,000 hectares. About 60 per cent of the rubber sent through Villa Bella is consigned by it. The total resources of this firm are said to aggregate about 50,000,000 bolivianos.

The German firm of Alfredo W. Barber & Co. has its central office in Cochabamba, with branches in Trinidad, Guayaramerin, and at several points in the Itenez country, where it possesses large *gomales*. It also has properties in the Abuna and Mamoré districts.

A long-established German company, Zeller, Villinger & Co., has rubber properties scattered from the Beni country to the upper Itenez region. It has houses at Riberalta, Guayaramerin, Baures, and Magdalena (Itenez), Santa Cruz, Trinidad, and Puerto Suarez (Rio Paraguay).

Brailard & Co., a French company, with headquarters at Riberalta, owns *gomales* in the Beni and along some of the rivers of the Territory of Colonias.

Another French company, known as Société Picollet, was founded in 1910 with a capital of 2,500,000 francs (1 franc = 19.3 cents normal exchange), which has been increased to about 3,500,000 francs. The center of operations of this firm is in the Abuna district, with a trading house at Manoa, at the mouth of the Abuna.

The trading house of Guillermo Demmer is located at Riberalta and owns *gomales* in northern Colonias.

The Sociedad Comercial Matto Grosso y Bolivia, which is the German firm of Stoffen, Schuack, Müller & Co., has trading stations at Guayaramerin, Santa Cruz, Puerto Suarez, Corumba (Brazil), and at certain points in the Itenez region. Most of its rubber properties are situated in the Itenez.

Still another German firm, Komarek & Bruckner, owns *gomales* in the Itenez and trading houses at Magdalena and Baures.

The rubber lands of the English Anglo-Bolivian Rubber Estates (Limited) are situated in the basin of the Rio Blanco, in the northern part of the Department of Santa Cruz. Its chief center of operations is Concepcion, in the Province of Velasco. It formerly took out most of its rubber through Puerto Suarez and the Rio Paraguay, but recently closed the former post.

The Bolivian, Nicanor G. Salvatierra, has large *gomales* in the Madre de Dios, Abuna, and Beni.

Besides these interests, there are scores of others with rubber estates, some of them aggregating over 200,000 hectares of land.

METHODS OF GATHERING

The methods of gathering the rubber used by the Bolivian *seringueiro* (extractor and coagulator) have become too familiar to the reading public to need further explanation in these columns. Daily tapping is generally practised and either hatchet or knife is used. The herring-bone system in which the knife is used is generally believed to be better for the tree than the deep incision made when using the hatchet. The chief trouble in the rubber country has sprung from labor questions. There has been a manifest improvement in the condition of the rubber gatherers in the past few years, though they have suffered from the rise in prices of necessities.

CLASSIFICATION OF RUBBER

On the arrival of a consignment of rubber at Manáos or Pará, a *bolacha* or sample ball is cut through several layers with a knife for the purpose of classifying the lot. Although the rubber is generally shipped as of two classes, fine or ordinary, there are eight classes in this preliminary inspection, namely: fina, fina fraca, entrefina, entre-fina-fraca, sernamby en rama, sernamby virgen, sernamby de caucho, and caucho. The rubber known as fine hard Pará is the prime product of the latex of the *Hevea* tree. Sernamby is second-quality rubber, although a product of the *Hevea*, as it contains impurities which decrease its value. It is sometimes made of the residue after the preparation of the fine Pará, or if rain has fallen in the cups with the latex the product will be classified as sernamby. Caucho is the product of the caucho tree and is an altogether lower grade of rubber.

PLANTATION COMPETITION

The rapid development of the East Indian plantations has seriously threatened the Amazonian rubber industry, which includes, of course, that of Bolivia, but the South American rubber interests have done little to meet it, only a few prominent rubber growers having planted trees to replace the gradually disappearing wild growth. Owing to their more economical methods the plantations have rapidly gained control of the world rubber market; since 1912 the price per pound of plantation rubber has been consistently a little lower than that of fine hard Pará.

EXPORTS OF RUBBER

The exports of rubber from Bolivia in 1918 were 2,860,509 kilos (1 kilo = 2.2 pounds) of fine valued at 8,272,579 bolivianos (1 boliviano = $0.389), and 1,427,005 kilos of ordinary, valued 2,765,463 bolivianos. In 1911, rubber exports constituted 22.89 per cent of the total value of exports from Bolivia, while in 1918 the percentage had fallen to 6.04.

The increasing importance of the United States as a buyer of Bolivian rubber is shown by the following table, which gives the percentage taken by the chief countries of destination since 1912:

Countries	1912 Per Cent	1913 Per Cent	1914 Per Cent	1915 Per Cent	1916 Per Cent	1917 Per Cent	1918 Per Cent
United States..	2.30	3.7	9.4	91.7	91.45	83.98	84.22
Germany	30.2	17.8	10.75	.3	.....	.....	.....
Belgium	12.5	8.9	3.5	....	.....	.....	.....
France	9.5	18.15	12.9	1.4	2.27	6.81	7.15
Great Britain ..	45.5	50.9	63.45	6.6	4.08	6.52	3.53

MAPS

Maps which show the location and extent of all rubber properties in Bolivia are in possession of the Latin-American Division of the Bureau of Foreign and Domestic Commerce, Department of Commerce, at Washington, D. C., and loan copies may be obtained from this source by persons or companies interested in the subject.

BALATA IN SURINAM

Recently, subscriptions for balata territory by auction took place for the first time in Surinam. There was no demand for these territories at the usual concession duty of 4½ Dutch cents per hectare. Only two firms bid, the Kersten concern offering 0.6-cent per hectare, and H. G. Bauer, whose bid was 0.5-cent.

The Kersten concern got the territories which are situated between the Coesewyne and the Saramacca and have an area of 154,300 hectares.

During the four months ended April, 1920, the exports of balata from this colony amounted to 107,324 kilograms, as against 113,417 kilograms during the corresponding period of 1919. This shows a decrease of 6,093 kilograms. The rubber exports during the same period in 1920 totaled 1,361 kilograms.

IMPORTS OF INDIA RUBBER AND GUTTA PERCHA INTO THE SERB-Crote-Slovene State during 1919 were 759,031 kilos (1 kilo equals 2.2 pounds), valued at 48,265,630 dinars. The par value of the dinar is $0.193 United States currency.

Recent Patents Relating to Rubber

THE UNITED STATES

GRANTED NOVEMBER 2, 1920

NO. 1,357,286 Pressure gage and tire valve. H. Gosstrom, assignor of one-twelfth to H. Gosstrom, one-eighteenth to J. E. Gosstrom, one-eighteenth to S. Gosstrom, and one-eighteenth to E. Gosstrom—all of Chicago, Ill.

1,357,378 Storage battery separator and process of manufacture. H. L. Boyer, assignor to Joseph Stokes Rubber Co.—both of Trenton, N. J.

1,357,601 Apparatus for administering anesthetics. W. P. Walter, assignor by mesne assignments to Safety Anaesthesia Apparatus Concern—both of Chicago, Ill.

1,357,633 Tire charging tube and tester. D. D. Getman, White Butte, S. D.

1,357,701 Hose. H. P. Goodall, Aldan, Pa.

1,357,909 Rubber hoof pad. M. M. Sherwood, Scranton, Pa.

GRANTED NOVEMBER 9, 1920

1,357,982 Chemical fire apparatus with fire hose, chemical tank, chemical hose, etc. A. B. House, Brooklyn, assignor to International Motor Co., New York—both in N. Y.

1,358,133 Rubberized, woolen-lined cover for hot-water bottles. D. S. Applegate, Chicago, Ill.

1,358,195 Washing brush with rubber rollers to regulate pressure. A. Gabryszek, Detroit, Mich.

1,358,279 Gun wad. W. G. Bond, Wilmington, Del.

1,358,285 Fountain pen. E. J. Casper, New York City.

1,358,308 Resilient wheel tire. G. E. Gilmore, Cleveland, O.

1,358,410 Cushion tire. E. E. Bull, Whitwell, Tenn.

1,358,511 Fountain pen clip and cap. C. W. Bowman, assignor to Eagle Pencil Co.—both of New York City.

1,358,523 Fountain toothbrush. J. T. Cook, Astoria, Ore.

1,358,524 Device for automatically inflating pneumatic tires. J. C. Cooper, Hempstead, Tex.

1,358,566 Reinforced pneumatic tire. W. A. Michero, Fort Worth, Tex.

1,358,568 Rubber eraser attachment for pencil. H. Moore, Brooklyn, N. Y.

1,358,576 Rubber composition separator for storage batteries. H. T. Roberg, Castana, Ia.

1,358,598 Cushioned metal French heel. C. Weis, Lancaster, Pa.

1,358,633 Hose mender. P. Hachmann, St. Louis, assignor of one-eighth to D. M. Hutchinson, Ferguson—both in Mo.

1,358,649 Dust cap for valve stems. M. F. Patton, Tuscaloosa, Ala., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

GRANTED NOVEMBER 16, 1920

1,358,711 Collapsible tire rim. C. B. Deeds, Savanna, Ill.

1,358,733 Bath device. A. F. Heine, Quincy, Ill.

1,358,753 Elastic shoelace. B. F. Killam and S. Schlesinger, Jr.—both of Denver, Colo.

1,358,775 Infant's garment supporter. A. Oberg, Chicago, Ill.

1,358,803 Demountable rim for tires. W. S. Watson, Cleveland, O.

1,358,852 Raincoat. F. W. Howard, New York City.

1,358,923 Demountable rim for tires. G. G. Barry, Chicago, Ill.

1,358,962 Pneumatic tire. J. W. McElvain, Springfield, Ill.

1,359,073 Respirator. F. W. and W. G. King, New York City, assignors to Julius King Optical Co., a corporation of New York.

1,359,112 Elastic fabric. M. W. Schloss, New York City, assignor to Treo Co., a corporation of New York.

1,359,267 Life preserver. A. Mossovitz, Baltimore, Md.

GRANTED NOVEMBER 23, 1920

1,359,573 Abdominal supporter. S. G. Brennan, Highland Park, Mich.

1,359,650 Shaving brush holder of rubber. L. A. Amis, Muskogee, Okla.

1,359,672 Hose supporter. R. J. Cavalier, Oswego, N. Y.

1,359,689 Balloon and parachute. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,359,690 Hard rubber fountain brush. C. A. Garvey, Clayton, Mo. (See THE INDIA RUBBER WORLD, December 1, 1920, page 184.)

1,359,717 Finger protector. L. J. McCarthy, assignor to Sears, Roebuck & Co.—both of Chicago, Ill.

1,359,805 Rubber-heel retaining device. T. L. Hollingsworth, assignor to The Fay Rubber Products Co.—both of Elyria, O.

1,359,835 Metal platform. F. I. Pease, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,359,838 Air cushion device. M. Petterson, Long Beach, Calif.

1,359,880 Self filling fountain pen. C. Dunn, Brooklyn, N. Y.

1,359,910 Elastic mailed sleeve for tires. J. Nowakowski, Detroit, Mich.

1,359,985 Bathing apparatus. S. D. Gromer, Tucson, Ariz.

1,359,999 Waterproof coat with inner rubber tubes downward from back collar edge. L. McEvoy, Chicago, Ill.

1,360,024 Water-containing vessel for preserving fruits and vegetables, with elastic socket member at mouth to prevent escape of water around stems of fruit, vegetables, etc., Luis Robichon, Mendoza, Argentina.

GRANTED NOVEMBER 30, 1920

1,360,292 Toothbrush with secondary rubber brush at end of handle. G. E. Hartman, Camden, N. J.

1,360,330 Device for detecting and locating subaqueous sounds. A. F. Sykes, New Barnet, and J. T. MacGregor-Morris, Hampstead, London—both in England.

1,360,588 Hose coupling. W. E. Sanderson, Los Angeles, Calif.

1,360,647 Fountain pen. C. R. Keeran, assignor by mesne assignments to Autopoint Pencil Co.—both of Chicago, Ill.

1,360,715 Waterproof coat. B. A. Bittan, Philadelphia, Pa.

1,360,811 Cushion heel with inserted diagonal calks. L. Stein, Washington, D. C.

1,360,893 Nipple and washer for feeding bottle. J. T. Cowie, Nanaimo, B. C., Canada.

1,360,907 Rubber tire having recessed rubber tread vulcanized to metal base. P. J. Ernenwein, New York City.

Chemical Patents will be found on pages 253, 254.

THE DOMINION OF CANADA

GRANTED NOVEMBER 2, 1920

205,217 Rubber tire having spaced closed air cells. J. C. Anderson, Washington, D. C., U. S. A.

205,325 Parachute fastener. The E. R. Calthrop's Aerial Patents, Limited, assignee of E. R. Calthrop—both of London, Middlesex, England.

GRANTED NOVEMBER 9, 1920

205,396 Resilient tire. V. L. Buchman, Trenton, New Jersey, U. S. A.

205,409 Tire rim for automobiles. T. W. Costello, San Francisco, California, U. S. A.

205,410 Tire rim for auto trucks. T. W. Costello, San Francisco, California, U. S. A.

205,414 Air hose stand. B. J. Daly, Oshkosh, Wis., U. S. A., administrator of the estate of L. J. Monahan, deceased.

205,424 Automobile wheel combining wheel having solid tire with auxiliary one having pneumatic tire. Oscar Englebert, Liège, Belgium.

205,539 Tire bead. The Fisk Rubber Co., Chicopee Falls, assignee of T. Midgley, Hampden—both in Massachusetts, U. S. A.

GRANTED NOVEMBER 16, 1920

205,641 Low-pressure alarm for pneumatic tires. W. A. Harris, Greenville, South Carolina, U. S. A.

205,692 Cushion tire. C. Warwick, Vancouver, B. C.

205,704 Bathing hat. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of J. T. Brogden, Providence, Rhode Island, U. S. A.

205,713 Rubber hose. Gutta Percha & Rubber, Limited, assignee of C. J. Otto—both of Toronto, Ont.

GRANTED NOVEMBER 23, 1920

205,844 Collapsible nursing bottle with integrally formed nipple. W. E. Goddard, Watertown, Wisconsin, U. S. A.

205,880 Respirator mask. F. L. Miller, Idaho Springs, Colorado, U. S. A.

205,889 Nipple for nursing bottle. M. H. McMann, New York City, U. S. A.

205,974 Vaginal douche of hard and soft rubber tubing with faucet cap. E. F. Ristine, Lexington, assignor of ten per cent each to B. Clark, St. Louis, and C. F. Ristine and C. Lyons, both of Lexington, and nine per cent to S. L. Ristine, Lexington—all in Missouri, U. S. A.

GRANTED NOVEMBER 30, 1920

206,036 Swimming glove. A. Gravel, Chicoutimi, Que.

206,041 Reinforced shoe heel. T. Hand, Orlando, Florida, U. S. A.

206,073 Shoe heel protector with rubber wearing lift. O. W. Peters, Los Angeles, California, U. S. A.

206,106 High rubber boot having lacing portion for adjustment at instep and ankle. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of C. W. Hubbell, Naugatuck, Connecticut, U. S. A.

THE UNITED KINGDOM

PUBLISHED OCTOBER 6, 1920

147,364 Detachable rim for tires. R. F. Roberts, Westcroft, Warlingham, Surrey.

147,392 Detachable rim for tires. E. Oliver, Daytona, Fla., U. S. A.

147,410 Apparatus for flexing book leaves, having rollers covered with vulcanized rubber, etc. T. H. Poynder, 3 Gun street, Reading, Berkshire.

147,419 Urethral syringe and irrigator. E. von Krohn (née Richter), 19 Lutherstrasse, Charlottenburg, Berlin. (Not yet accepted.)

147,420 Submarine signaling apparatus having sound tube insulated by supporting it on rubber rings. A. Behm, 31 Hardenbergstrasse, Kiel, Germany. (Not yet accepted.)

147,521 Golf-ball marker. J. D. Lyon, Cincinnati, Ohio, U. S. A.

147,656 Marine life-saving device of waterproof canvas, etc., stretched over a collapsible metal framework. J. G. M. Poterin du Motel, 64 rue de Saussune, Paris. (Not yet accepted.)

147,717 Pneumatic tires so constructed as to prevent overheating. J. Marc, 8 rue de Helder, Paris. (Not yet accepted.)

PUBLISHED OCTOBER 13, 1920

147,930 Rubber stamp. J. Pritzke, 19 Turkenstrasse, Berlin. (Not yet accepted.)

147,993 Parachute. E. R. Calthrop, Eldon Street House, Eldon street, London.

148,007 Solid tire with gable-like section. E. B. Killen, 27 Queen Victoria street, London.

148,017 Dust cap for tire valves. Dunlop Rubber Co., 14 Regent street, Westminster, and W. C. J. Schlie, Alma street, Coventry.

148,020 Combined metal shank and heel-piece, the latter adapted to hold revoluble rubber heel pad. J. Hesketh, 30 Orleans Road, Old Swan, Liverpool.

148,048 Table football played with miniature hollow rubber football. W. C. S. D. Ford, 278 Upland Road, East Dulwich, London.

148,164 Artificial teeth replaceable permanently on vulcanite denture without revulcanization. S. Myerson, 129 Columbia Road, Boston, Mass., U. S. A. (Not yet accepted.)

148,192 Gas respirator. H. Guillemard, France. (Not yet accepted.)

148,220 Tire with rim enclosing air-tube and band covering tread. Société Anonyme du Pneu Economique, 42 rue de Beffroi, Brussels. (Not yet accepted.)

148,234 Spring wheel with rubber inserted in melted state. J. P. Bem, San Francisco, Calif., U. S. A.

148,244 Tire with rim enclosing airtube. H. de Hooydonck, avenue Edouard VII, Biarritz, France. (Not yet accepted.)

Machinery Patents on pages 257, 258.

PUBLISHED OCTOBER 20, 1920

148,298 Wheel tire reinforced by rawhide layer between fabric layers. L. Loeb, New York City, U. S. A. (Not yet accepted.)

148,438 Spring wheel with rubber tread. E. F. Erickson, 159 Twenty-fifth street, Brooklyn, New York, U. S. A. (Not yet accepted.)

148,439 Spring wheel with rubber tread. E. F. Erickson, 159 Twenty-fifth street, Brooklyn, New York, U. S. A. (Not yet accepted.)

148,565 Wheel with detachable rim for tires. Baker Wheel & Rim Co., assignees of E. K. Baker—both of 140 South Dearborn street, Chicago, Ill., U. S. A.

148,674 Tire valve. T. A. Low, Renfrew, Ontario, Can.

148,726 Reinforced rubber heel. W. D. Bing, Northampton House, Albion Road, St. Peters-in-Thanet, Kent.

PUBLISHED OCTOBER 27, 1920

148,772 Tire puncture patch. A. Thiele, 99 Potsdamerstrasse, Berlin, assignee of E. Thiele (née Muhleise), 15 Beaumontstrasse, Magdeburg, Germany. (Not yet accepted.)

148,862 Metal reinforced detachable rubber heel. V. B. Greco, 1126 Franklin street, and W. F. Baum, 84 West 11th street—both in Waterloo, Ia., U. S. A. (Not yet accepted.)

149,058 Device for cleaning and repairing drain-pipes consisting of one large central and two smaller end rubber disks clamped between metal plates connected by rods. J. Moakes, 17 Brindley street, Paddington, London.

149,096 Waterproof suit for aviators' wear. W. Peterson, 34 Arlington street, Newark, New Jersey, U. S. A.

149,173 Replaceable rubber-covered button for garters, suspenders, etc. J. Pollard, Rose Cottage, Killiney, County Dublin.

149,183 Revoluble rubber heel. J. T. McNay, 62 Northumberland Road, Old Trafford, Manchester.

149,204 Urethral syringe. Becton, Dickenson & Co., Rutherford, New Jersey, U. S. A., assignees of G. J. Duggan.

GERMANY

PATENTS ISSUED, WITH DATES OF ISSUE

329,926 (October 28, 1919.) Automatic tube connection. W. Baumeister, Herthastrasse 33, Essen.

330,926 (April 24, 1920.) Hygienic nipple for nursing bottle. P. Elzer, Gumberstrasse 81, Düsseldorf-Eller.

TRADE MARKS

THE UNITED STATES

SERIAL NUMBERS PUBLISHED SEPTEMBER 28, 1920*

NO. 106,414 The word KNO-BIND—garters. D. M. Worth, Bucyrus, O.

124,429 Representation of an alligator bearing an alligator-skin hand-bag in his mouth and having the word ALLIGATOR on his side—tire patches. Alligator Grip Co., Dallas, Tex.

124,964 Representation of a shield surmounted by a wreath enclosing the initials W. S.—rubber and fabric tires, tubes, tire boots and patches. Washington Tire & Rubber Co., Spokane, Wash.

127,350 The word MERLIN—rubber tires and tubes. The Batavia Rubber Co., Batavia, N. Y.

128,105 Representation of a cross-section of a tire surrounding the letters O'N—solid and pneumatic tires of rubber and rubber reinforced with fabric, and rubber inner tubes. The Owen Tire & Rubber Co., Cleveland, O.

131,953 The word ANTELOPE—rubber hose reinforced with fabric. The B. F. Goodrich Co., New York City.

131,957 The word DIRUBCO—rubber hose and belting reinforced with fabric. The B. F. Goodrich Co., New York City.

131,960 The word ELK—rubber hose reinforced with fabric and pump-valves wholly or partly rubber. The B. F. Goodrich Co., New York City.

131,962 The word LYNX—belts of fabric combined with rubber. The B. F. Goodrich Co., New York City.

132,017 Representation of a tire through which is thrust an arm and hand wearing a rubber glove and holding an instrument—rubber goods and sundries for hospitals, dentists, druggists, surgeons, etc. The Miller Rubber Co., Akron, O.

133,552 Conventionalized representation of a tire enclosing a shield against which is silhouetted a castle—pneumatic tires and tubes. New Castle Rubber Co., New Castle, Pa.

135,776 The words MONO and TWIN separated by the words TRADE MARK—solid rubber tires. The United States Tire Co., New York City. (See THE INDIA RUBBER WORLD, July 1, 1920, page 661.)

SERIAL NUMBERS PUBLISHED OCTOBER 5, 1920*

127,723 The word KLEINERT'S—rubber or rubberized material, sponge-bags, nursery-bags, bathing-suit bags and diaper-bags, and rubber tourist-cases. I. B. Kleinert Rubber Co., New York City.

127,727 Representation of a Maltese cross bearing the word KLEINERT suspended by a ring from a ribbon bearing the words THE BEST—rubber or rubberized material, sponge, nursery, bathing-suit, and diaper bags, and rubber tourist cases. The I. B. Kleinert Rubber Co., New York City.

SERIAL NUMBERS PUBLISHED OCTOBER 30, 1920*

131,859 Representation of head of a rhinoceros above the word RHINO—golf balls. Cupples Company Manufacturers, St. Louis, Mo.

132,466 The word DYCO within a horizontal ellipse superimposed upon a double-outlined circle—dental, medical, surgical, and sanitary appliances of or containing gutta percha, rubber, elastic fabric, etc. Du Pont Young Corporation, Boston, Mass.

133,663 The word HABIRSHAW—electric cable. Habirshaw Electric Cable Co., New York City.

*Notice of opposition must be filed with the United States Patent Office at Washington, D. C., within thirty days after this date.

SERIAL NUMBERS PUBLISHED NOVEMBER 2, 1920*

120,715 The word OLDFIELD, having the letter O represented by a reproduction of an Oldfield tire and all the letters having the appearance of traveling along a road—rubber tires, inner tubes, tire fabrics, accessories, and tire repair gum materials in sheet form. The Oldfield Tire Co., Cleveland, O.

129,201 The word LOX-ON—tire valve fixtures. Automatic Safety Tire Valve Corporation, New York City.

SERIAL NUMBERS PUBLISHED NOVEMBER 5, 1920*

121,897 The word SANITAL in stenciled letters—belting, hose and packing of rubber, balata, fabric, etc. Imperial Belting Co., Chicago, Ill.

123,259 The words RE-NU-R—leather and rubber fabric dressing. George W. Roth, Minneapolis, Minn.

124,313 The word SKOGUM—rubber jar rings. Smalley, Kivlan & Onthank, Boston, Mass.

124,583 The word SANDERSOLED within a geometric outline—retreaded rubber and fabric tires. D. A. Sanders, Nyack, N. Y.

SERIAL NUMBERS PUBLISHED NOVEMBER 6, 1920*

124,133 The word BENNIE having the end letters larger than the others and with them forming an enclosure for the word Springfield—pneumatic tires. Alexander Bennie & Co., Nashville, Tenn.

126,356 Representation of an airplane flying through a tire bearing the words RUBBER ACE, the whole above a cloud-bank and the words MASTER OF AIR—tire fillers made of spongy rubber. Elgin Rubber Ace Co., Elgin, Ill.

130,026 The word FEDERAL—reliners, tire sleeves or patches, tires, tubes, hose, tubing, balls, gaskets, packing, and valves, of rubber or rubber and fabric. The Federal Rubber Co., Cudahy, Wis.

132,149 The words SYRA-CORD—tire casings and shoes. Syracuse Rubber Co., Inc., Syracuse, N. Y.

132,339 The letters A-B-C—brake-lining, clutch facings, fan-belts, packing, radiator hose, tube repair kits, etc. American Brake-Lining Co., Lansdale, Pa.

134,263 The word EVEREADY—rubber and other kinds of hose. Oxweld Acetylene Co., Newark, N. J.

135,337 Representation of a Marathon runner—inner tubes. The Marathon Tire & Rubber Co., Cuyahoga Falls, O.

135,400 Representation of a hammer poised above a black triangle cutting the upper portion of a circle—belting, hose and packing, etc., of rubber and other materials. C. O. Alexander, Philadelphia, Pa.

135,412 The words RUBBER ACE—fillers for tires, made of spongy rubber. Elgin Rubber Ace Co., Elgin, Ill.

135,413 The words MASTER OF AIR—fillers for tires, made of spongy rubber. Elgin Rubber Ace Co., Elgin, Ill.

136,326 The word SUPERITE—fountain pens. De Witt-La France Co., Cambridge, Mass.

SERIAL NUMBERS PUBLISHED NOVEMBER 10, 1920*

129,612 The word TIRETEX—woven fabrics in the piece for vehicle tires. Thistle Cotton Mills, Inc., Ilchester, Md.

131,601 The word SANSCO—infants' sanitary pants and bibs. N. Scoville, St. Louis, Mo.

131,658 Representation of section of a rainbow and the word RAINBOW—elastic webbing. The Russell Manufacturing Co., Middletown, Conn.

131,662 Representation of an elk's head within a conventionalized frame bearing the word ELK—elastic webbing. The Russell Manufacturing Co., Middletown, Conn.

131,663 Representation of the rock of Gibraltar and the word GIBRALTAR—elastic webbing. The Russell Manufacturing Co., Middletown, Conn.

131,747 Representation of an alligator within a circle beneath the word ALLIGATOR—elastic webbing. The Russell Manufacturing Co., Middletown, Conn.

131,751 The word CHALLENGE—elastic webbing. The Russell Manufacturing Co., Middletown, Conn.

132,932 The word "SHIRLASTIC"—sanitary belts. I. B. Kleinert Rubber Co., New York City.

134,268 The words ARCH MOTOR SHOES within a rectangle—men's, women's and children's boots, shoes and slippers of leather, rubber and fabrics. Thomas G. Plant Co., Boston, Mass.

134,853 Representation of a globe bearing the words BARNUN ON EARTH—shoes of rubber, fabric and leather combined. Frank Roth, Taylor, Pa.

SERIAL NUMBERS PUBLISHED NOVEMBER 17, 1920*

125,442 Black seal bearing in white letters around the edge the words, R. T. VANDERBILT CO., New York, N. Y. AMERICAN PRODUCTS, and in the center the words BLUE RIDGE CLAY—clay used as a filler in rubber compounds. R. T. Vanderbilt, Inc., New York City.

131,665 The word SHAMROCK above the representation of a shamrock—elastic webbings. The Russell Manufacturing Co., Middletown, Conn.

132,793 The word KNICKERBOCKER—massage shower and bath sprays. Knickerbocker Manufacturing Co., Chicago, Ill. (See THE INDIA RUBBER WORLD, August 1, 1903, page 381; October 1, 1918, page 18.)

133,044 The letter C containing the letter X, both in outline—tires and tubes. The Converse Rubber Shoe Co., Malden, Mass.

136,228 The words JIM'S TIRE JIMMYS—tire jimmies. The Wallace' Barnes Co., Bristol, Conn.

136,561 Conventional representation of a tire containing the words "OUR DADDY'S CHOICE"—tire patches. The Jones & Jones Co., Kingman, Kans.

SERIAL NUMBERS PUBLISHED NOVEMBER 23, 1920*

107,945 Representation of a stencilled design consisting of the word OILTITE within a diamond-shaped outline all above the words JENKINS BROS.—rubber packing. Jenkins Rubber Co., Elizabeth, N. J.

121,953 The word JUSTA arranged in the form of an upright cross above the word PRODUCTS, all within a conventional outline—tires, patches for inner and outer tubes, and fan-belts of fabric and rubber. C. W. D. Vance, Oklahoma, Okla.

127,725 The word KLEINERT'S—rubber household aprons, baby-pants. I. B. Kleinert Rubber Co., New York City.

127,965 Representation of flat section of white hose having black and orange-colored stripes extending lengthwise—rubber-lined fabric hose. The Gutta Percha & Rubber Manufacturing Co., New York City.

134,142 The words RAMO TIRES—rubber and fabric pneumatic tire shoes and rubber inner tubes. The Ramo Tire & Rubber Co., Pittsburgh, Pa.

134,144 Shaded representation of a tire containing a shield formed of the words REPUBLIC BELTING CO.—leather and rubber belting. Republic Belting Co., Inc., Baltimore, Md.

135,376 The word REVERSETTE—rubber coats. W. McPherson, Cambridge, Mass.

135,481 The words "LION'S PAW"—tires and patches. Loeser & Sons, Terre Haute, Ind.

136,431 The word ROMANJO superimposed in black letters above an outline representation of a swastika—rubber tires and tubes. Romanjo Tire Co., Chicago, Ill.

137,350 The word MILLRITE with two small figures of workmen working on end letters—leather, rubber and composition belting. Wayne Belting & Supply Co., Fort Wayne, Ind.

137,462 The word GRAINVEY—fabric and rubber elevator belts. The B. F. Goodrich Co., New York City.

137,464 The word ORION—fabric and rubber belts. The B. F. Goodrich Co., New York City.

SERIAL NUMBERS PUBLISHED DECEMBER 1, 1920*

106,283 The words RED LINE with a broad red line drawn through the words longitudinally—rubber and fabric tires, inner tubes, patches, reliners, etc. C. Palmer, Grand Rapids, Mich.

118,993 Representation of a fish with the word HERRINGBONE on its side—fabric and rubber machinery packings. N. B. Miller, New York City.

125,372 Representation of an Indian's head beneath the word NIMIGRET—waterproofed canvas or duck covers. Eastern Finishing Works, Inc., Kenyon, R. I.

128,098 The word "KIDDIE"—baby-pants. I. B. Kleinert Rubber Co., New York City.

130,668 The word FIRESTONE—pneumatic and solid tires, inner tubes, rubber-impregnated tire-building and rebuilding fabrics, tire accessories, and tire repair gum materials in sheet form. The Firestone Tire & Rubber Co., Akron, O.

137,624 The word NOPCONY—preservatives for driving belts of leather, rubber or cotton. Neatsfoot Oil Products Co., New York City.

THE UNITED KINGDOM

PUBLISHED SEPTEMBER 15, 1920

395,121 The words GOMME DACO—erasers. Darras & Cie., 59 rue des Petits-Champs, Paris, France; address for service in the United Kingdom, care of Boult, Wade & Tennant, 112 Hatton Garden, London, E. C. 1.

402,462 The word "MAN-ARK"—rubber soles and heels. W. I. J. Oldershaw, trading as W. Oldershaw, 779 Romford Road, Manor Park, London, E. 12.

402,665 The word "GUIDE"—rubber tires. The F. E. Partridge Rubber Co., Limited, 1 Metcalf street, Guelph, Ontario, Canada; address for service in the United Kingdom, care of Abel & Imray, 30 Southampton Buildings, London, W. C. 2.

404,789 The word ECLIPSE—ink and pencil erasers. Joseph Dixon Crucible Co., Wayne and Monmouth streets, Jersey City, New Jersey, U. S. A.; address for service in the United Kingdom, care of A. M. & William Clark, 53-54 Chancery Lane, London, W. C. 2.

405,403 Circular design enclosing representation of clouds and lightning shaft darting through a coil of cable, together with the inscription C. C. C. Co.—rubber insulated electric cables. Callender's Cable & Construction Co., Limited, Hamilton House, Victoria Embankment, London, E. C. 4.

B406,504 The word TALMO—bicycle tires and tire covers, and tires and tiring for perambulators and baby carriages. Brown Brothers, Limited, 22-34 Great Eastern street, London, E. C. 2.

PUBLISHED SEPTEMBER 22, 1920

405,374 The letters C and X arranged in a monogram—rubber boots and shoes. Converse Rubber Shoe Co., 392 Pearl street, Malden, Mass., U. S. A.; address for service in the United Kingdom, care of John E. Raworth & Moss, 75 Victoria street, Westminster, London, S. W. 1.

PUBLISHED SEPTEMBER 29, 1920

403,875 Representation of a horse rampant being driven by an elephant, also rampant, riding on his back—rubber soled shoes and galoshes. Kay Bros., 1 Brazil street, Manchester.

403,881 The words GOLF CLUBS above a representation of a set of four golf clubs enclosed in a wreath formed of two sprays of leaves tied with ribbon bow—rubber soled shoes and galoshes. Kay Bros., 1 Brazil street, Manchester.

404,057 The word MULTASBEST—electric cables. Ward & Goldstone, Sampson Works, Springfield Lane, Salford, Manchester.

PUBLISHED OCTOBER 6, 1920

395,122 The words GOMME ECLAIR pierced by representation of a dart of lightning—erasers. Darras & Cie., 59 rue des Petits-Champs, Paris, France; address for service in the United Kingdom, care of Boult, Wade & Tennant, 112 Hatton Garden, London, E. C. 1.

402,142 The word VULCAZOL—chemical accelerator used in vulcanizing rubber. Ricard, Allenet & Cie, Distilleries des Deux-Sèvres, à Melle (Deux Sèvres), France; address for service in the United Kingdom, care of Abel & Imray, 30 Southampton Buildings, London, W. C. 2.

403,331 The word BEAVER—goods manufactured from india rubber, gutta percha, or balata, not included in classes other than No. 40. The Beldam Packing & Rubber Co., Limited, 29 Gracechurch street, London, E. C. 3.

403,804 The letters B E V within a conventional triangular double-outlined border—rubber tires. British Electric Vehicles, Limited, 1 Queen Victoria street, London, E. C. 4.

405,699 Representation of an eagle standing on a section of twisted cable or rope, holding elastic and handle of catapult in bill and claw, respectively—elastic hose, supporters, sleeve and blouse retainers, and hat guards. W. J. Adams & Co., Limited, 20 Mount street, Manchester.

PUBLISHED OCTOBER 13, 1920

403,808 The word WILBAR—goods manufactured from india rubber, and gutta percha, not included in classes other than No. 40. Williams & Bartlett, 147 Corporation street, Birmingham.

405,484 The word TALMAK—braces, suspenders, and belts. A. & F. Tallent, Limited, 23-33 Wenlock street, New North Road, London, N. 1.

406,437 The word RUBBAX—asphalt and asphaltic compounds (for mixing with rubber), included in Class No. 4. United States Asphalt Refining Co., 90 West street, New York City, U. S. A.; address for service in the United Kingdom, care of White, Langner, Stevens & Parry, Jessel Chambers, 88 Chancery Lane, London, W. C. 2.

B407,498 The word SILVERTOWN—golf and tennis balls. India Rubber, Gutta Percha & Telegraph Works Co., Limited, 106 Cannon street, London, E. C. 4.

THE DOMINION OF CANADA

REGISTERED

27,267 Representation of a winged foot between the syllables of the word GOODYEAR—rubber and balata goods, including waterproofed fabrics, solid and pneumatic tires, inner tubes, accessories, belting, hose and packing, tubing, molded goods, cement, and leather substitutes. The Goodyear Tire & Rubber Company of Canada, Limited, New Toronto, Ont.

27,297 The word Moco associated with the representation of twin monkeys and the words Monkey Grip beneath—tire patches. The Moco Company of America, Oklahoma City, Okla.

27,299 Representation of a globe surrounded by a band bearing the word DOMINION—rubber manufacturing machinery, chucks, shafting, cores, molds, etc. Dominion Steel Products Co., Limited, Brantford, Ont.

27,332 The word ADAPTA—rubber soles and heels. The Micrometer Engineering Co., Limited, 41 Spon street, Coventry, England.

27,348 Representation of a fleur-de-luce bearing the letters S. R. C. surrounded by a circular band bearing the words: THE SEAMLESS RUBBER COMPANY, NEW HAVEN, CONN.—druggists' rubber sundries. The Seamless Rubber Co., Inc., New Haven, Conn., U. S. A.

27,395 The words KLINGTITE and GOOD-YEAR, with representation of a winged foot separating the syllables of the last word—rubber and balata goods, including pneumatic and solid tires, inner tubes, tire accessories, belting, hose and packing, tubing, molded goods, cement, leather substitutes, etc. The Goodyear Tire & Rubber Company of Canada, Limited, Toronto, Ont.

27,419 The letters "U. F. O."—tires and tubes. F. D. Law, Oakville, Ont.

27,486 The words "MAPLE LEAF"—rubber manufacturers of all kinds, including boots and shoes; automobile, motorcycle, and bicycle tires and tubes; belting, hose, and packing; gaskets; valves; matting; water-bottles; gloves; raincoats, etc. Canadian Consolidated Rubber Co., Limited, Montreal, Que.

27,487 Representation of a maple leaf—rubber manufactures of all kinds, including boots and shoes; automobile, motorcycle, and bicycle tires and tubes; belting, hose, and packing; gaskets; valves; matting; water-bottles; gloves; raincoats, etc. Canadian Consolidated Rubber Co., Limited, Montreal, Que.

27,523 Representation of the ace of spades having thereon the letter A—hard rubber insulation equipment, combs, buttons, cutlery handles, druggists' hard rubber sundries, acid bottles, dental gum, sheets, rods, tubes, pipe, elbows, tees, nuts, cocks, closet seats, penholders, rulers, ink-stands, etc. American Hard Rubber Co., New York City, U. S. A.

27,526 The words MIRACLE and BLOW OUT PATCH arranged between two concentric circles spaced apart with the legend "IT'S RAWHIDE," and a representation of a sheet of rawhide within the inner circle—blow-out and puncture patches, reliners and interliners for tires. Rawhide Products Corporation, New York City, U. S. A.

27,534 The word TOPAZ in Gothic type—rubber sponges and sponge rubber goods. Featheredge Rubber Co., Inc., Chicago, Ill., U. S. A.

27,549 The word COMPRESSION—inner tubes. U. S. Compression Inner Tube Co., Tulsa, Okla., U. S. A.

27,586 The words TINY TOT and the representation of an infant reclining on a powder puff—druggists' sundries and infants' rubber goods. United Drug Co., Limited, Toronto, Ont.

27,602 The word SARIVAL—baled cotton. Southwest Cotton Co., Phoenix, Ariz., U. S. A.

DESIGNS

THE UNITED STATES

NO. 56,490 Tire casing. Patented November 2, 1920. Term 3½ years. M. S. Ackles, assignor to Lincoln Highway Tire Co.—both of Fulton, Ill.

56,589 Eraser head for lead pencils. Patented November 16, 1920. Term 14 years. Eberhard Faber, New York City.

56,490 56,616 56,620 56,623 56,619 56,688 56,691

56,616 Tire tread. Patented November 16, 1920. Term 7 years. E. C. Hufford and W. S. Bates, Watts, Calif.

56,619 Tire tread. Patented November 16, 1920. Term 14 years. O. J. Kuhlke, assignor to The Amazon Rubber Co.—both of Akron, O.

56,620 Tire. Patented November 16, 1920. Term 14 years. J. W. Mart, assignor to The Cascade Tire & Rubber Co.—both of Ravenna, O.
56,623 Tire tread. Patented November 16, 1920. Term 14 years. W. H. Paull, Birmingham, assignor to The Dunlop Rubber Co., Limited, London—both in England.
56,688 Tire. Patented November 30, 1920. Term 14 years. W. P. Braender, Passaic, N. J.
56,691 Tire. Patented November 30, 1920. Term 14 years. A. L. Breitenstein, Akron, assignor to The Ideal Tire & Rubber Co., Cleveland—both in Ohio.
56,712 Pneumatic-tired wheel for vehicles. Patented November 30, 1920. Term 7 years. R. Stock, Sandusky, O.
56,713 Pneumatic-tired wheel for vehicles. Patented November 30, 1920. Term 7 years. R. Stock, Sandusky, O.

THE DOMINION OF CANADA

4,924 Tire tread. Patented November 9, 1920. W. A. F. Oakley, Hamilton, Ont.
4,925 Tire tread. Patented November 9, 1920. H. Crowder, Toronto, Ont.
4,926 Tire. Patented November 9, 1920. H. H. Hastings, Toronto, Ont.
4,943 Tire tread. Patented November 23, 1920. Canadian Rockland Tire & Rubber Corporation, Limited, Toronto, Ont.

GERMANY

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

753,388 (September 16, 1920.) Rubber sole and heel. Victor Herkner, Blumenthalstrasse 28, Köln-on-the-Rhine.
753,903 (August 21, 1920.) Device for repairing rubber tubing. Chemische Fabrik Eugen Ganz, G.m.b.H., Frankfort-on-Main.
754,000 (August 30, 1920.) Stretchable rubber sole. August Ullrich, Kaiser Wilhelmstrasse 55, Mannheim-Neckarau.
754,183 (September 11, 1920.) Rubber sole with protector of solid material. Friedrich Theilmann, Waldstrasse 54, Frankfort-on-Main.
754,518 (September 29, 1920.) Rubber heel. Karl Forster, Pirmasens.
754,519 (September 29, 1920.) Rubber heel. Karl Forster, Pirmasens.
754,937 (August 12, 1920.) Cycle tire cover with steel band insertion. Josef Waltl, Daiserstrasse 20, München.
754,979 (September 18, 1920.) Rubber bottle stopper. G. D. Alfred Petersen, Wolfgangstrasse 147, Frankfort-on-Main.
755,188 (May 5, 1920.) Appliance for retaining compressed air in automobile tires. Rudolf Bartz, Jr., Fliethstrasse, München-Gladbach.

RUBBER TRADE INQUIRIES

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(835) A rubber manufacturer desires to purchase a machine for testing belting and hose friction.

(836) We are asked where chlorinated rubber may be obtained.

(837) An inquiry for a simplified viscometer for rubber cements and solutions has been received.

(838) The address of the maker of an electric machine for cutting sheet rubber is requested.

(839) A reader requests the address of manufacturers of rubber composition polishing wheels.

(840) A rubber manufacturer desires to know where phenanthrene can be obtained.

(841) A subscriber asks for a list of concerns who either use or manufacture an electric cutter for cutting thin sheet rubber.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet, and state number.

DISTRICT OFFICES.
New York: 734 Customhouse.
Boston: 1801 Customhouse.
Chicago: 504 Federal Building.
St. Louis: 402 Third National Bank Building.
New Orleans: 1020 Hibernia Bank Building.
San Francisco: 307 Customhouse.
Seattle: 848 Henry Building.

COOPERATIVE OFFICES.
Cleveland: Chamber of Commerce.
Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Dayton, Ohio: Dayton Chamber of Commerce.
Los Angeles: Chamber of Commerce.
Philadelphia: Chamber of Commerce.
Portland, Oregon: Chamber of Commerce.

(34,086) A commercial agent in Spain desires to secure an agency for the sale of rubber, wire and electrical wares. Correspondence in French or Spanish.

(34,107) A manufacturing firm in Italy desires to secure an agency for the sale of raincoats, rubber shoes, and other rubber articles, chemical products, etc. Correspondence in Italian or French.

(34,114) A commercial agent in Bulgaria desires to secure an agency for the sale of rubber heels and elastic for congress gaiters. Quote c. i. f. port of Varna. Payment one-third in advance with order and two-thirds upon arrival of goods.

(34,134) An inquiry has been received from a man in England wishing to secure the representation of firms for the maintenance of a permanent exhibit of American goods, such as motor fittings for English motor cars, motor car trimmings, electrical goods, toys, dental goods, surgical goods, pens and accessories.

(34,154) A mercantile company in India desires to secure an agency and purchase rubber tires and tubes of good quality. Quote c. i. f. Karachi or Calcutta preferred, also f. o. b. American ports. Payment 60 days' sight draft through any exchange bank.

(34,164) The manager of a mercantile company in China is in the United States and desires to purchase and secure an agency for the sale of rubber goods.

(34,170) A commercial representative in Spain desires to secure an agency on commission for the sale of rubber articles. Correspondence in French or Spanish.

BRAZILIAN NOTES

The rubber firm of Alfredo Valle & Ca., Pará, that failed for 1,000:000$, operated with a fictitious capital of 50:000$, it is said. Surprise is expressed that such institutions as the Bank of Brazil, Mercantile Bank and Banco Ultramarino should have been successfully duped. It is reported that the firm in question gambled in exchange to the extent of 800:000$ and shipped large quantities of rubber by fraudulent means.

Reports from the rubber districts of Brazil claim that that industry is in danger of extinction owing to foreign manipulation. The Brazilian Congress has recently passed a law authorizing an issue of $8,000,000 in paper currency to be lent to the States in order that production may be increased. The currency has depreciated, in terms of American money, over 70 per cent. Labor troubles have been numerous.

Industria Brazileira de Borracha "Berrogain," Limitada, Rua Lima Barros, 71, Santo Christovão, Rio de Janeiro, Brazil, is the successor to Raul Berrogain, rubber manufacturer. Mr. Berrogain will continue as technical director of the new firm.

RUBBER EXPORTS FROM BAHIA

Exports of rubber through the port of Bahia, Brazil, during 1918 were 234 metric tons valued $112,775; during 1919, 301 metric tons were exported, valued $119,717. The following are the declared exports of rubber from Bahia to the United States during 1918 and 1919:

		1918		1919	
		Quantity	Value	Quantity	Value
Rubber:					
Mangabeira	*pounds*	.....	.....	40,062	$11,778
Maniçoba		301,800	$77,155	517,885	101,364

FOREIGN TRADE MARKS

The *Diario Oficial* of Uruguay for August 19, 1920, contains notice of an application on August 12 by Juan and José Drysdale & Co., of Buenos Aires, for the registration of the trade mark "Sterling" for a large list of articles, including raw india rubber and rubber and the like in sheets, threads, pipes and tubes, and tents and awnings of waterproofed cloth. In Uruguay ownership of a trade mark is based on priority of registration. However, the owner may challenge its registration by a third party, but to secure annulment, evidence of prior use in Uruguay must be presented and this action taken within two years from the date of the filing of the trade mark. The right of action in such cases is expressly granted to owners of foreign trade marks.

Review of the Crude Rubber Market

NEW YORK

OTHER than frequent buying of small spot lots and occasional factory orders, the crude rubber market was dull and featureless during the past month. The market continues to be very unsettled with lower prices, not only here but in London and Singapore where futures are declining along with the New York spot and nearby market.

Low records were made for standard plantation rubber—16¾ cents for spot first latex crêpe and 16 cents for spot ribbed smoked sheets, while January-March deliveries for these grades were down to 17½ and 17 cents, respectively.

There are still heavy stocks of spot rubber, and mouldy plantation rubber continues to come into the market, where it sells for two, and sometimes three cents under the prices for spot standard quality. These lots are picked up by dealers who sort them, and by manufacturers who realize that good quality mouldy rubber is a bargain at these prices.

The market for Pará sorts has been practically lifeless, a low mark of 18 cents for upriver fine being recorded.

Crude rubber arrivals continue to fall. Imports for November, 1920, were 6,448 tons, compared with 15,674 tons last year. Total imports for the first eleven months of 1920 were 210,060 tons, compared with 201,557 tons for the same period in 1919. Curtailment of production has already begun at producing centers and if continued according to the plan of the Rubber Growers Association, United States imports of plantations in 1921 may be reduced to 160,000 tons.

Spot and future quotations in standard plantations and Brazilian sorts were as follows:

PLANTATIONS. December 1, first latex crêpe, 19 to 19½ cents; January-March, 22½ cents; April-June, 25 cents; July-December, 29 cents.

December 27, first latex crêpe, 16¾ cents; January-March, 17½ cents; April-June, 19 cents; July-December, 23½ cents.

December 1, ribbed smoked sheets, 18 to 18½ cents; January-March, 21½ cents; April-June, 23½ cents; July-December, 28 cents.

December 27, ribbed smoked sheets, 16 cents; January-March, 17½ cents; April-June, 18½ cents; July-December, 23 cents.

December 1, No. 1 amber crêpe, 16½ cents.

December 27, No. 1, amber crêpe, 14 cents.

December 1, No. 1, rolled brown crêpe, 14 cents.

December 27, No. 1, rolled brown crêpe, 11 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. December 1, upriver fine, 20½ cents; islands fine, 19 cents; upriver coarse, 15 cents; islands coarse, 14 cents; Cametá coarse, 14 cents; caucho ball, 15 cents.

December 27, upriver fine, 18½ cents; islands fine, 18 cents; upriver coarse, 14 cents; islands coarse, 11½ cents; Cametá coarse, 12 cents; caucho ball, 10 to 14½ cents.

NEW YORK QUOTATIONS

Following are the New York spot quotations, for one year ago, one month ago, and December 27, the current date:

	January 1, 1920	December 1, 1920	December 27, 1920
PLANTATION HEVEA—			
First latex crêpe	$0.55 @	$0.19 @	$0.16¾ @
Amber crêpe No. 1	.53 @	.16½ @	.14 @
Amber crêpe No. 2	.52 @	.15½ @	.13 @
Amber crêpe No. 3	.51 @	.14½ @	.12 @
Amber crêpe No. 4	.49 @	.13½ @	.11 @
Brown crêpe, thick and thin	.49 @	.15 @	.10 @
Brown crêpe, specky	.45 @	.15 @.14½	.09 @
Brown crêpe, rolled	.43½ @	.14 @	.11 @
Smoked sheet, ribbed, standard quality	.55 @	.17½ @	.16 @
Smoked sheet, plain, standard quality	$0.50 @	$0.16 @	$0.15 @
Unsmoked sheet, standard quality	.48 @	.15 @	.14 @
Colombo scrap No. 1	.38 @	.13 @	.12 @
Colombo scrap No. 2	.36 @	.12 @	.11 @
EAST INDIAN—			
Assam crêpe	.49 @.50	@	@
Assam onions	@	@	@
Penang block scrap	.38½ @	@	.08 @
PONTIANAK—			
Banjermassin	.13 @	.07½ @	.08 @
Palembang	.14 @	.08 @	.08½ @
Pressed block	.24 @	.15½ @	.12½ @
Sarawak	.12 @	.07 @	.07½ @
SOUTH AMERICAN—			
PARAS—			
Upriver, fine	.50 @	.20 @.21	.18 @.18½
Upriver, medium	@	.17 @	.15 @.16
Upriver, coarse	.37 @	.15½ @	.14 @
Upriver, weak, fine	.40 @	.15 @.16	.14½ @
Islands, fine	.47 @	.19½ @	.18 @.18½
Islands, medium	.47 @.48	*.14 @	.15 @
Islands, coarse	.22 @	.14 @.14½	.11½ @
Cametá, coarse	.24 @.25	.14 @	.12 @
Madeira, fine	.51 @	.24 @.25	.23 @.24
Acre Bolivian, fine	.51 @.52	.20 @.21½	.18½ @.19
Peruvian, fine	.51 @	.18 @.19	.16 @.17
Tapajos, fine	.50 @	.19 @	.17½ @.18
CAUCHO—			
Upper caucho ball	.34½ @	.16 @.16½	.14½ @.15
Lower caucho ball	.29½ @	.10 @.10½	.10 @
MANICOBAS—			
Ceará negro heads	@	.14 @	*.12 @
Ceará scrap	@	.06 @	*.06 @
Manicoba, 30% guarantee	@	.11 @	*.10 @
Mangabeira thin sheet	@	.18 @	*.15 @
CENTRALS—			
Corinto scrap	.34½ @	.12 @	.12 @
Esmeralda sausage	.34½ @	.12 @	.12 @
Central scrap	.34 @	.12 @	.12 @
Central scrap and strip	.32 @	.10 @	.10 @
Central wet sheet	.23 @	.07 @	.08 @
Guayule, 20% guarantee	.28 @	*.20 @	*.20 @
Guayule, washed and dried	.38 @	*.30 @	*.30 @
AFRICANS—			
Niger flake, prime	.18 @	@	.15 @
Benguela, extra No. 1, 28%	@	@	@
Benguela, No. 2, 32½%	@	.09 @	.06½ @
Conakry niggers	@	@	@
Congo prime, black upper	.37 @	@	.14 @
Congo, prime, red upper	@	@	.08 @
Kassai, black	.37 @	@	@
red	@	@	@
Massai sheets and strings	.40 @	@	@
Rio Nunez ball	.40 @	@	@
Rio Nunez sheets and strings	.40 @	@	@
GUTTA PERCHA—			
Gutta Siak	.27½ @	.17 @.18	.16 @.17
Red Macassar	2.60 @	2.25 @2.90	2.30 @3.00
BALATA—			
Block, Ciudad Bolivar	.59 @	.70 @	.62 @
Colombia	.53 @	.47 @.48	.40 @
Panama	.45 @	@	.30 @.35
Surinam sheet	.86 @	.72 @.73	.69 @
amber	.90 @	.80 @	.75 @

*Nominal.

RECLAIMED RUBBER

The point has been passed where the low price of crude rubber influences the demand for reclaimed. The warehouses of the reclaimers are heavily stocked with goods made on contracts and against which no requisitions are forthcoming for shipment to rubber manufacturers.

In many branches of the industry rubber factories are shut down completely, operating on half time or continuously at fractional capacity. This is true of those which are large users of reclaim as well as of tire makers, hence outlets for reclaims are virtually closed and the business is marking time. Nevertheless, the trade is hopeful of a marked revival of business early in the new year.

The following quotations are nominal and are the same as reported for November, 1920.

NEW YORK QUOTATIONS

DECEMBER 27, 1920

Prices subject to change without notice

STANDARD RECLAIMS			
Floating	*$0.22	@	$0.24
Friction	* .25	@	.30
Mechanical	* .11	@	.12
Shoe	* .14¼	@	.15½
Tires, auto	* .14½	@	.15
truck	* .12½	@	.13½
White	* .20	@	.21

*Nominal.

THE MARKET FOR COMMERCIAL PAPER

In regard to the market for crude rubber paper, Albert B. Beers, 1 Liberty street, New York City, advises as follows:

"During December demand for paper has been light, and almost entirely from out-of-town banks, which have been practically looking only for bargains, so that the best rubber names have ruled at about 9 per cent, and those not so well known 9½ per cent."

COMPARATIVE HIGH AND LOW NEW YORK SPOT RUBBER PRICES

	December					
	1920*		1919		1918	
PLANTATIONS						
First latex crêpe	$0.20	@$0.16¼	$0.55	@$0.51	$0.58	@$0.54
Smoked sheet ribbed	.19	@ .16	.55	@ .51	.56	@ .52
PARAS						
Upriver, fine	.21½	@ .18	.49	@ .47	.66	@ .62
Upriver, coarse	.15	@ .13¼	.36½	@ .35	.39½	@ .36½
Islands, fine	.19	@ .18	.48¼	@ .46¾	.57	@ .53
Islands, coarse	.14½	@ .11½	.22	@ .21	.24	@ .24¼
Cametá	.14	@ .11¾	.23½	@ .23	.26	@ .25

* Figured to December 26, 1920.

AMSTERDAM RUBBER MARKET

JOOSTEN & JANSSEN, Amsterdam, report [December 3, 1920]:

In the period under review one can speak at last of an actual rise, which, however, was not lasting. By good demand and rather big turnover, especially on all kinds of terminal deliveries, prices increased from 3 to 5 cents. Sheets enjoyed much attention at about 5 cents below crêpe.

In spot rubber hardly any business could be done owing to prices being too high. Holders did not make use of the temporary increase and prices fell back again, about 2 to 3 cents.

At the close, the market was steady and prices for crêpe and sheets are about 76 cents and 71 cents on the spot, 76 and 71 January—March, 82 and 76 April—June.

SINGAPORE RUBBER MARKET

GUTHRIE & CO., LIMITED, Singapore, report [November 4, 1920]:

The local rubber market declined rapidly over the week-end in sympathy with the depression in other markets where there has been an absence of trade demand and forced liquidation of heavy stocks by dealers. At the weekly auctions held yesterday the chief buyers were conspicuous by their absence, and something approaching a collapse in prices occurred. Demand was confined to a few Chinese buying to cover, and the bulk of the rubber offered had to be withdrawn. Standard ribbed smoked sheet sold up to 41½ cents per pound, a decline of 9 cents. Standard crêpe is not quoted, but four lots sold from 42 to 44 cents. Off quality crêpe and sheet was unsalable. Lower grades were freely sold, but at a considerable sacrifice in prices, the average decline being 7 to 10 cents.

Of 848 tons catalogd, only 186 tons were sold, the lowest sale on record. The following is the course of values:

	In Singapore per pound[1]			Sterling Equivalent per pound in London		
Sheet, fine ribbed smoked	38½c	@	41½c	1/ 1½	@	1/ 2
Sheet, good ribbed smoked	25	@	38	—/ 9¼	@	1/ 1
Crêpe, good pale	28	@	34	—/10⅝	@	1/ 0⅝
Crêpe, fine brown	26½	@	30½	—/10¼	@	—/11⅜
Crêpe, good brown	20	@	26	—/ 8⅜	@	—/10½
Crêpe, dark	17	@	23	—/ 7½	@	—/ 9¼
Crêpe, bark	15	@	21½	—/ 7	@	—/ 8⅜

[1] Quoted in Straits Settlements currency, $1 = $0.567 United States currency.

RUBBER EXPORTS FROM PENANG

		January 1 to November 2	
		1919	1920
To Great Britain	piculs[1]	186,406	217,959
Europe		.....	3,796
United States		110,637	142,176
Totals	piculs	297,043	363,931

[1] One picul equals 133⅓ pounds.

CEYLON RUBBER IMPORTS AND EXPORTS

IMPORTS

		January 1 to November 8	
		1919	1920
Crude rubber:			
From Straits Settlements	pounds	2,283,533	2,330,204
India		1,403,718	1,367,243
Burma and other countries		1,567	42,768
Totals	pounds	3,688,818	3,740,215

EXPORTS

Crude rubber:			
To United Kingdom	pounds	24,216,628	35,748,868
Belgium		29,120	169,550
France		383,400	698,713
Germany		.....	409,472
Netherlands		.....	22,730
Italy		.....	230,720
Norway		.....	2,240
Spain		13	.....
Australia		.....	56
Victoria		98,755	286,836
United States		52,685,069	30,943,682
New South Wales		154,212	438,092
Canada and Newfoundland		668,294	425,600
India		2,649	2,176
Straits Settlements		454	44,800
Japan		267,427	204,730
Totals	pounds	78,506,021	69,628,265

Compiled by the Ceylon Chamber of Commerce.

PLANTATION RUBBER EXPORTS FROM JAVA*

		September		Nine Months Ended September 30	
		1919	1920	1919	1920
To Netherlands	kilos	582,000	319,000	1,564,000	3,451,000
Great Britain		905,000	1,192,000	5,687,000	6,297,000
Germany		.....	.....	.....	70,000
France		39,000	.....	215,000	11,000
Belgium		.....	26,000	.....	57,000
Other European destinations		.....	.....	.....	.....
United States		1,832,000	656,000	13,410,000	10,161,000
Singapore		593,000	224,000	4,074,000	3,194,000
Japan		1,000	.....	181,000	184,000
Australia		.....	.....	245,000	190,000
Other countries		126,000	.....	159,000	.....
Totals	kilos	4,078,000	2,417,000	25,535,000	23,615,000
Ports of origin:					
Tandjeng Priok	kilos	1,614,000	1,041,000	13,215,000	10,977,000
Samarang		85,000	43,000	431,000	346,000
Soerabaya		2,121,000	1,283,000	10,872,000	11,532,000

*August—figures 1919 and 1920 revised.

FEDERATED MALAY STATES RUBBER EXPORTS

An official report from Kuala Lumpur states that the exports of rubber from the Federated Malay States in the month of October amounted to 8,323 tons as compared with 7,604 tons in September and 8,381 tons in the corresponding month last year. The total export to the end of October was 88,585 tons as against 88,205 tons last year and 64,043 tons in 1918.

Appended are the comparative statistics:

		1918	1919	1920
January	tons	7,588	7,163	11,119
February		6,820	10,809	9,781
March		7,709	10,679	9,524
April		7,428	7,664	8,375
May		5,851	7,308	7,627
June		5,161	7,094	9,049
July		5,706	8,640	8,043
August		5,291	10,626	9,140
September		6,588	9,841	7,604
October		5,901	8,381	8,323
Totals	tons	64,043	88,205	88,585

STRAITS SETTLEMENTS RUBBER EXPORTS

An official report from Singapore states that the exports of rubber from Straits Settlements ports in the month of October amounted to 9,882 tons, compared with 9,791 tons in September (transhipments 1,061 tons) and 8,338 tons in the corresponding month last year. The total export for ten months amounts to 110,602 tons as against 118,290 tons last year and 54,876 tons in 1918. Appended are the comparative statistics:

		1918	1919	1920
January	tons	4,302	14,404	13,125
February		2,334	15,661	17,379
March		8,858	20,908	5,931
April		6,584	10,848	9,768
May		13,587	15,845	15,617
June		6,515	5,059	11,663
July		1,978	7,818	10,773
August		1,249	8,933	6,673
September		6,209	10,476	9,791
October		3,260	8,338	9,882
Totals	tons	54,876	118,290	110,602

ANTWERP RUBBER ARRIVALS

DECEMBER 3. By the S. S. "Anversville," from the Congo.		
Société Anonyme Bungé (Cie. du Congo belge)	*kilos*	12,340
Société Anonyme Bungé (Cie. de l'N'Kémé & l'N'Kéni)		1,404
Société Anonyme Bungé (Plantation Lacourt)		1.640
Société Anonyme Bungé (Comptoir Colonial Belgika)		16.865
Société Anonyme Bungé (Grands Lacs)		8.476
Société Anonyme Bungé (Forminière)		9.430
Société Anonyme Bungé (Various)		13.370
Crédit Colonial & Commercial (Anc. L. & W. Van de Velde) (Cie. du Kassai)		113,780
Various		18.736
Total	*kilos*	196.041

Compiled by Grisar & Co., Antwerp.

CRUDE RUBBER ARRIVALS AT ATLANTIC AND PACIFIC PORTS AS STATED BY SHIPS' MANIFESTS

PARAS AND CAUCHO AT NEW YORK

	Fine	Medium	Coarse	Caucho	Pounds Totals
DECEMBER 1. By the S. S. "Michael," from Pará.					
General Rubber Co.	.....	.....	.....	.....	40,180
Poel & Kelly	80,754	.....	12,371	33,306	126,431
H. A. Astlett & Co.	58,570	.....	14,060	24,600	97,230
Meyer & Brown, Inc.	156,800	.....	.....	42,560	199,360
Various	.....	.....	.....	.....	268,088
DECEMBER 2. By the S. S. "Virgil," from Pará.					
Poel & Kelly	43,007	2,212	9,200	5,404	59,823
DECEMBER 9. By the S. S. "Cavour," from Pará.					
Poel & Kelly	33,544	1,347	5,893	.....	40,784
DECEMBER 20. By the S. S. "Pennsylvania," from Montevideo.					
Neuss, Hesslein & Co.	78,988	.....	.....	.....	78,988
Everett, Heaney & Co.	.....	.....	.....	.....	41,062
William Schall & Co.	.....	.....	.....	.....	20,874

PLANTATIONS

(Figured 180 pounds to the bale or case)

	Shipment from:	Shipped to:	Pounds	Totals
NOVEMBER 22. By the S. S. "Akita Maru," at New York.				
Mitsui & Co., Limited	Singapore	New York	57,780	
Fred Stern & Co.	Singapore	New York	11,200	
Various	Telok Anson	New York	23,040	
Various	P't Sw't'nh'm	New York	30,060	
Various	Penang	New York	1,800	
The Goodyear Tire & Rubber Co.	Colombo	New York	126,000	
Chas. T. Wilson Co., Inc.	Colombo	New York	63,900	
Various	Colombo	New York	55,980	
Various	Singapore	New York	19,760	389,520
NOVEMBER 23. By the S. S. "Ningchow," at New York.				
Hood Rubber Co.	Far East	Watertown	257,600	257,600
NOVEMBER 24. By the S. S. "West Amargosa," at New York.				
Fred Stern & Co.	Singapore	New York	56,000	
Meyer & Brown, Inc.	Singapore	New York	11,200	
Various	Singapore	New York	515,460	582,660
NOVEMBER 24. By the S. S. "Valacia," at New York.				
Various	London	New York	180	180
NOVEMBER 29. By the S. S. "Teenkai," at New York.				
Fred Stern & Co.	Batavia	New York	125,440	
Various	Batavia	New York	26,200	
Various	Soerabaya	New York	117,720	269,360
NOVEMBER 29. By the S. S. "Ceylon Maru," at New York.				
L. Littlejohn & Co., Inc.	Colombo	New York	22,400	
Various	Colombo	New York	350,920	373,320
DECEMBER 4. By the S. S. "Rotterdam," at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	22,400	22,400
DECEMBER 6. By the S. S. "Egremont Castle," at New York.				
William H. Stiles & Co.	Singapore	New York	145,600	
Meyer & Brown, Inc.	Singapore	New York	593,600	
E. S. Kuh & Valk Co.	Singapore	New York	9,900	
L. Littlejohn & Co., Inc.	Singapore	New York	479,813	
W. R. Grace & Co.	Singapore	New York	88,380	
Aldens' Successors, Inc.	Singapore	New York	128,160	
Fred Stern & Co.	Singapore	New York	271,040	
F. R. Henderson & Co.	Singapore	New York	187,020	
The Fisk Rubber Co.	Singapore	Chicopee Falls	67,200	
Poel & Kelly	Singapore	New York	144,360	
Eastern Rubber Co.	Singapore	New York	375,840	
General Rubber Co.	Singapore	New York	583,300	
X. W. Obalski & Co., Inc.	Singapore	New York	48,960	
Thos. A. Desmond & Co.	Singapore	New York	67,680	
Various	Singapore	New York	3,066,280	6,257,133

	Shipment from:	Shipped to:	Pounds	Totals
DECEMBER 6. By the S. S. "West Carnifax," at New York.				
East Asiatic Co., Inc.	Soerabaya	New York	17,280	
Meyer & Brown, Inc.	Singapore	New York	100,800	
W. R. Grace & Co.	Singapore	New York	174,240	
Innes & Co.	Singapore	New York	180	
A. C. Fox & Co.	Batavia	New York	55,980	
Fred Stern & Co.	Batavia	New York	7,920	
Various	Batavia	New York	17,640	
Various	Singapore	New York	43,440	417,480
DECEMBER 6. By the S. S. "Grace Dollar," at New York.				
Hood Rubber Co.	Far East	Watertown	92,828	92,828
DECEMBER 6. By the S. S. "Ajax," at New York.				
The Goodyear Tire & Rubber Co.	Penang	Akron	57,600	
Various	Penang	New York	293,580	
Poel & Kelly	Singapore	New York	20,160	
Baird Rubber & Trading Co.	Singapore	New York	24,300	
L. Littlejohn & Co., Inc.	Singapore	New York	201,600	
William H. Stiles & Co.	Singapore	New York	56,000	
Meyer & Brown, Inc.	Singapore	New York	89,600	
W. T. Sargent & Sons.	Singapore	New York	19,800	
Rogers-Pyatt Shellac Co.	Singapore	New York	79,020	
W. R. Grace & Co.	Singapore	New York	104,400	
Winter, Ross & Co.	Singapore	New York	43,920	
Thos. A. Desmond & Co.	Singapore	New York	151,200	
General Rubber Co.	Singapore	New York	945,180	
H. A. Astlett & Co.	Singapore	New York	112,000	
Rome Wire Co.	Belawan-Deli	New York	11,160	
East Asiatic Co., Inc.	Belawan-Deli	New York	25,200	
J. Aron & Co.	Belawan-Deli	New York	27,000	
Aldens' Successors, Inc.	Belawan-Deli	New York	21,600	
General Rubber Co.	Belawan-Deli	New York	50,400	
Firestone Tire & Rubber Co.	Belawan-Deli	Akron	96,300	
The Fisk Rubber Co.	Singapore	Chicopee Falls	33,600	
Fred Stern & Co.	Singapore	New York	56,000	
Various	Belawan-Deli	New York	359,180	
Various	Singapore	New York	361,300	3,250,100
DECEMBER 8. By the S. S. "Birmingham City," at New York.				
Fred Stern & Co.	Medan	New York	22,400	
W. R. Grace & Co.	Singapore	New York	138,600	
L. Littlejohn & Co., Inc.	Singapore	New York	29,700	
Thornett & Fehr, Inc.	Singapore	New York	201,600	
American Trading Co.	Singapore	New York	29,520	
Rogers-Pyatt Shellac Co.	Singapore	New York	111,060	
Meyer & Brown, Inc.	Singapore	New York	56,000	
Various	Singapore	New York	14,380	603,260
DECEMBER 17. By the S. S. "Langton Hall," at New York.				
L. Littlejohn & Co., Inc.	Singapore	New York	22,400	22,400
DECEMBER 18. By the S. S. "City of Dunkirk," at New York.				
Boston Insulated Wire & Cable Co.	Singapore	New York	4,140	
W. R. Grace &Co.	Singapore	New York	128,160	
Baird Rubber & Trading Co.	Singapore	New York	19,800	
Meyer & Brown, Inc.	Singapore	New York	56,000	
L. Littlejohn & Co., Inc.	Singapore	New York	336,000	
F. R. Henderson & Co.	Singapore	New York	122,580	
A. C. Fox & Co.	Singapore	New York	30,060	
Fred Stern & Co.	Singapore	New York	56,000	
Poel & Kelly	Singapore	New York	181,800	
Eastern Rubber Co.	Singapore	New York	186,480	
Converse Rubber Shoe Co.	Singapore	New York	14,400	
Rogers-Pyatt Shellac Co.	Singapore	New York	64,260	
American Trading Co.	Singapore	New York	83,160	
Aldens' Successors, Inc.	Singapore	New York	93,960	
Mitsui & Co., Limited	Singapore	New York	80,820	
General Rubber Co.	Singapore	New York	1,829,880	
Thos. A. Desmond & Co.	Singapore	New York	40,320	
Thornett & Fehr, Inc.	Singapore	New York	116,820	
The Fisk Rubber Co.	Singapore	Chicopee F'ls	371,840	
Firestone Tire & Rubber Co.	Singapore	Akron	92,160	
Various	Singapore	New York	218,840	
Poel & Kelly	Malacca	New York	9,900	
Various	Malacca	New York	8,460	
Various	Teluk Anson	New York	24,300	
F. R. Henderson & Co.	Port Dickson	New York	23,940	
Various	Port Dickson	New York	9,540	
Various	Penang	New York	5,400	
Various	P. Swettenham	New York	3,240	4,212,260
DECEMBER 19. By the S. S. "Nieuw Amsterdam," at New York.				
Meyer & Brown, Inc.	Rotterdam	New York	22,400	
Various	Rotterdam	New York	26,100	48,500
DECEMBER 19. By the S. S. "Clan MacFadjen," at New York.				
Fred Stern & Co.	Colombo	New York	4,220	
Meyer & Brown, Inc.	Cochin	New York	30,420	
Various	Cochin	New York	213,120	247,760

PLANTATIONS—Continued

	Shipment from:	Shipped to:	Pounds.	Totals.
DECEMBER 20. By the S. S. "City of Hankow," at New York.				
Thornett & Fehr, Inc....	Colombo	New York	8,820	
Aldens' Successors, Inc.	Colombo	New York	5,040	
The Goodyear Tire & Rubber Co.....	Colombo	Akron	65,340	
Pacific Trading Corp. of America	Colombo	New York	28,800	
Poel & Kelly.....	Colombo	New York	54,180	
Fisk Rubber Co.....	Singapore	Chicopee Falls	33,600	
L. Littlejohn & Co., Inc.	Colombo	New York	56,260	
Various	Colombo	New York	822,500	1,074,540
DECEMBER 20. By the S. S. "Aquarius," at New York.				
United States Rubber Co.	Singapore	New York	243,360	
Various	Colombo	New York	129,240	372,600
CENTRALS				
NOVEMBER 22. By the S. S. "Colon," at New York.				
Ultramares Corp.	Cristobal	New York	1,200	1,200
NOVEMBER 25. By the S. S. "Caracas," at New York.				
Scholz & Co.....	Puerto Cabello	New York	5,250	5,250
DECEMBER 1. By the S. S. "Esperanza," at New York.				
Various	Cristobal	New York	12,750	12,750
DECEMBER 18. By the S. S. "Panama," at New York.				
C. W. Jacob & Allison..	Cristobal	New York	1,050	
G. Amsinck & Co., Inc.	Cristobal	New York	6,750	
Various	Cristobal	New York	1,950	9,750
AFRICANS				
NOVEMBER 25. By the S. S. "Ryndam," at New York.				
Various	Rotterdam	New York	70,035	70,035
NOVEMBER 27. By the S. S. "Julia Luckenbach," at New York.				
Various	Rotterdam	New York	109,365	109,365
DECEMBER 6. By the S. S. "Rotterdam," at New York.				
Various	Rotterdam	New York	56,350	56,350
DECEMBER 8. By the S. S. "La Lorraine," at New York.				
The B. F. Goodrich Co..	Havre	New York	1,380	1,380
DECEMBER 14. By the S. S. "Canada," at New York.				
Various	Marseilles	New York	115,000	115,000
DECEMBER 16. By the S. S. "Soestdijk," at New York.				
Various	Rotterdam	New York	74,520	74,520
GUTTA SIAK				
DECEMBER 6. By the S. S. "Egremont Castle," at New York.				
Various	Singapore	New York	128,400	128,400
BALATA				
NOVEMBER 22. By the S. S. "Colon," at New York.				
Isaac Brandon & Bros..	Cristobal	New York	1,500	1,500
NOVEMBER 27. By the S. S. "Meroke," at New York.				
Middleton & Co., Limited	Surinam	New York	1,930	
Wm. Schall & Co.....	Dutch Guiana	New York	23,369	25,299
DECEMBER 1. By the S. S. "Victoria," at New York.				
South & Central America Comm'l Co.....	Trinidad	New York	2,760	
Various	Trinidad	New York	12,840	15,600
DECEMBER 1. By the S. S. "Vinton County," at New York.				
Mecke & Co.....	Cristobal	New York	2,760	
Pablo Calvet & Co.....	Cristobal	New York	4,255	7,015
DECEMBER 10. By the S. S. "Maturo," at New York.				
South & Central America Comm'l Co..	Port of Spain	New York	10,950	
G. Amsinck & Co., Inc..	Port of Spain	New York	15,000	25,950
DECEMBER 20. By the S. S. "Quilleta," at New York.				
Ultramares Corp.....	Guayaquil	New York	3,150	3,150
GUAYULE				
NOVEMBER 26. By rail at Eagle Pass, Texas.				
Continental-Mexican Rubber Co.	Mexico	New York	55,000	55,000

CUSTOM HOUSE STATISTICS

PORT OF NEW YORK

IMPORTS

	October 1919 Pounds	October 1919 Value	October 1920 Pounds	October 1920 Value
UNMANUFACTURED—*free:*				
Crude rubber:				
From Belgium	18	$9	44,550	$10,264
France	903,765	277,812	.....	.....
Netherlands	424,224	202,338	51,546	24,993
England	8,757,468	4,314,311	143,246	43,648
Nicaragua	.....	.....	6,252	1,731
Honduras	1,885	575	.....	.....
Costa Rica.....	856	348	.....	.....
Panama	15,024	5,356	.....	.....
Argentina	3,322	1,661	.....	.....
Mexico	8,216	2,417	10,712	1,835
Trinidad	4,351	2,200	.....	.....
Bolivia	79,959	25,808	375	145
Haiti	1,000	400	.....	.....
Brazil	2,941,514	1,302,557	2,369,369	576,346
Columbia	30,965	10,913	22,054	6,214
Jamaica	.....	.....	1,900	982
Ecuador	10,043	2,960	2,887	560
Peru	68,988	19,576	50,629	13,705
Uruguay	28,600	13,415	.....	.....
Venezuela	88,695	32,163	19,525	8,819
British India.....	481,200	193,448	22,449	10,291
British Guiana	5,548	4,723	.....	.....
Straits Settlements.	13,685,973	5,507,611	11,307,078	4,501,293
British East Indies.	5,532,307	2,373,191	1,813,330	603,967
Dutch East Indies..	5,755,742	2,450,961	3,556,174	1,455,579
Philippine Islands..	32,013	11,000	.....	.....
Totals	38,861,676	$16,755,753	19,422,076	$7,260,372
Jelutong (Pontianak):				
From England	56,000	$10,080	.....	.....
Straits Settlements.	2,085,125	296,070	166,680	$17,270
Dutch East Indies..	388,928	75,427	131,342	19,427
Totals	2,530,053	$381,577	298,022	$36,697
Gutta percha:				
From England	995	$370	.....	.....
Straits Settlements.	412,290	73,039	94,837	$28,119
Dutch East Indies.	93,698	17,910	429,227	90,882
British W. Africa..	262,132	36,003	.....	.....
Totals	769,115	$127,322	524,064	$119,001
Balata:				
From England	9,077	$9,203	.....	.....
Ecuador	1,200	650	.....	.....
Colombia	31,842	10,595	2,667	$1,081
Panama	23,296	9,312	.....	.....
Brazil	.....	.....	770	616
Venezuela	21,190	7,053	19,353	12,284
Bolivia	.....	.....	4,296	2,638
French Guiana.....	.....	.....	46,285	34,940
British Guiana.....	32,509	21,665	14,190	7,178
Dutch Guiana.....	29,414	26,110	24,456	14,179
Totals	148,528	$84,588	112,017	$72,916
Reclaimed and scrap rubber.	289,554	16,795	239,121	13,025
Totals unmanufactured.	42,598,926	$17,366,035	20,595,300	$7,502,011
Manufactures of rubber and gutta percha.....	.....	$43,345	.....	$54,955
Guayule	124,223	18,595	.....	.....
Rubber substitutes...*dutiable*	.....	.....	15,620	3,385
Chicle .....*dutiable*	500,845	347,145	279,358	237,124
Totals	625,068	$409,085	294,978	$295,464
EXPORTS				
MANUFACTURED:				
Automobile tires.....	.....	$2,027,789	.....	$2,800,553
Inner tubes.....	.....	.....	.....	321,962
Solid tires.....	.....	.....	.....	118,140
All other tires.....	.....	138,164	.....	55,257
Belting	.....	295,421	.....	172,812
Hose	.....	.....	.....	258,773
Packing	.....	.....	.....	125,174
Rubber boots.....*pairs*	15,761	27,414	8,623	25,268
Rubber shoes.....*pairs*	474,329	396,886	501,560	508,747
Soles and heels.....	.....	.....	.....	60,019
Druggists' sundries.....	.....	78,889	.....	105,607
Other rubber manufactures.	.....	569,450	.....	462,021
Totals, manufactured..	.....	$3,534,013	.....	$5,014,333
Insulated wire.....	.....	$443,671	.....	$493,671
Fountain pens.....*number*	25,789	33,850	51,292	57,785
Suspenders and garters.....	.....	162,049	.....	258,097
Chewing gum.....	.....	190,565	.....	154,696
Totals	.....	$830,135	.....	$964,249
UNMANUFACTURED—*free:*				
Reclaimed and scrap rubber.	601,350	$78,864	425,601	$48,582
FOREIGN EXPORTS				
Crude rubber	370,242	$148,226	1,008,721	$334,231
Balata	5,300	3,366	41,320	17,219
Rubber scrap.....	.....	.....	4,500	705
Rubber manufactures	.....	19,364	.....	3,107
Rubber substitutes	.....	.....	44,250	14,632

PORT OF BOSTON

IMPORTS

	October 1919 Pounds	October 1919 Value	October 1920 Pounds	October 1920 Value
UNMANUFACTURED—*free:*				
Crude rubber:				
From England	56,510	$31,221	.....	.....
Straits Settlements.	.....	.....	7,000	$2,503
British East Indies.	.....	.....	67,940	17,246
Totals	56,510	$31,221	74,940	$19,749
Rubber scrap and reclaimed.	.....	.....	14,883	$930
Rubber manufactures.*dutiable*	.....	$3,567	.....	2,217

EXPORTS

	October 1919 Pounds	October 1919 Value	October 1920 Pounds	October 1920 Value
MANUFACTURED:				
Automobile tires	.....	$1,115	.....	$2,457
Inner tubes	.....	.....	.....	552
Other tires	.....	.....	.....	801
Belting	.....	388	.....	3,638
Hose	.....	.....	.....	4,654
Packing	.....	.....	.....	299
Rubber boots.....pairs	8,396	23,622	7,705	26,964
Rubber shoes.....pairs	94,245	71,114	106,910	110,219
Soles and heels	.....	.....	.....	3,862
Druggists' sundries	.....	1,932	.....	12,245
Other rubber manufactures	.....	13,981	.....	13,144
Totals	.....	$112,152	.....	$178,835
Insulated wire	.....	$14,086	.....	$425
Suspenders and garters	.....	13,127	.....	17,337
Rubber scrap and reclaimed	8,907	855	.....	.....

PORT OF NEW ORLEANS

IMPORTS

MANUFACTURED—*free:*				
From Nicaragua	5,300	$1,375	2,000	$616
Totals	5,300	$1,375	2,000	$616

EXPORTS

MANUFACTURED:				
Automobile tires	.....	$19,105	.....	$138,237
Inner tubes	.....	.....	.....	16,354
Solid tires	.....	.....	.....	22,098
All other tires	.....	135	.....	7,636
Belting	.....	1,228	.....	9,068
Hose	.....	.....	.....	24,309
Packing	.....	.....	.....	1,255
Rubber boots.....pairs	.....	.....	50	212
Rubber shoes.....pairs	2,176	2,425	33,371	43,217
Soles and heels	.....	.....	.....	3,241
Druggists' sundries	.....	22	.....	265
Other rubber manufactures	.....	432	.....	5,201
Totals	.....	$23,347	.....	$271,093
Insulated wire	.....	$3,083	.....	$16,599
Fountain pens.....number	60	89	13	31
Suspenders	.....	128	.....	11,569
Chewing gum	.....	2,006	.....	1,890

PORT OF SEATTLE

IMPORTS

UNMANUFACTURED—*free:*				
Crude rubber:				
From Straits Settlements	1,463,441	$599,642	.....	.....
Canada	2,063	1,001	360	$98
Hongkong	33,360	11,676	.....	.....
Japan	565,423	254,354	.....	.....
Totals	2,064,287	$866,673	360	$98
Rubber manufactures	.....	$4	.....	$30

EXPORTS

MANUFACTURED:				
Automobile tires	.....	$9,114	.....	$24,415
Inner tubes	.....	.....	.....	4,034
Solid tires	.....	.....	.....	3,928
All other tires	.....	2,344	.....	8
Belting	.....	1,656	.....	1,239
Hose	.....	.....	.....	2,207
Packing	.....	.....	.....	521
Rubber boots.....pairs	49	208	315	1,347
Rubber shoes.....pairs	2,875	4,255	810	1,497
Druggists' sundries	.....	1,452	.....	189
Other rubber manufactures	.....	7,253	.....	1,920
Totals	.....	$26,282	.....	$41,305
Insulated wire	.....	$195	.....	$562
Fountain pens.....number	.....	205	1,327	1,858
Suspenders	.....	545	.....	1,112
Chewing gum	.....	340	.....	.....
Reclaimed rubber	138,688	6,114	96,310	2,058

PORT OF SAN FRANCISCO

IMPORTS

UNMANUFACTURED—*free:*				
Crude rubber:				
From Straits Settlements	1,486,843	$597,562	840,940	$174,758
Dutch East Indies	64,054	19,740	.....	.....
Japan	.....	.....	22,400	6,224
Totals	1,550,897	$617,302	863,340	$180,982
Jelutong (Pontianak)	.....	.....	9,200	$736
Rubber manufactures	.....	$846	.....	473

EXPORTS

MANUFACTURED:				
Automobile tires	.....	$48,694	.....	$230,288
Inner tubes	.....	.....	.....	31,359
Solid tires	.....	.....	.....	14,010
All other tires	.....	1,228	.....	5,075
Belting	.....	10,621	.....	43,710
Hose	.....	.....	.....	44,497
Packing	.....	.....	.....	34,734
Rubber boots.....pairs	1,028	2,910	168	200
Rubber shoes.....pairs	3,220	2,949	4,258	4,960
Soles and heels	.....	.....	.....	18,341
Druggists' sundries	.....	1,814	.....	6,608
Other rubber manufactures	.....	7,588	.....	25,443
Totals	.....	$75,804	.....	$459,225
Insulated wire	.....	$1,212	.....	$4,986
Fountain pens.....number	216	320	165	212
Suspenders	.....	5,903	.....	3,938
Chewing gum	.....	782	.....	1,964
UNMANUFACTURED—*free:*				
Reclaimed and scrap rubber	2,000	75	.....	.....

EXPORTS OF INDIA RUBBER AND CAUCHO FROM MANAOS DURING SEPTEMBER, 1920

	EUROPE Fine	EUROPE Medium	EUROPE Coarse	EUROPE Caucho	EUROPE Totals	NEW YORK Fine	NEW YORK Medium	NEW YORK Coarse	NEW YORK Caucho	NEW YORK Totals	Grand Totals
EXPORTERS:											
Stowell & Co.....kilos	.....	.....	.....	.....	.....	52,442	12,550	2,277	106,099	173,368	173,368
General Rubber Co. of Brazil	.....	.....	.....	.....	.....	125,322	7,028	12,487	163	145,000	145,000
Tancredo, Porto & Co.	.....	.....	.....	.....	.....	101	11,133	4,848	30,795	46,877	46,877
J. Adonias & Co.	.....	.....	.....	.....	.....	.....	1,000	.....	.....	1,000	1,000
Totals from Manáos.....kilos	.....	.....	.....	.....	.....	177,865	31,711	19,612	137,057	366,245	366,245
In transit from Iquitos	8,074	4,491	2,436	9,156	24,157	26,132	22,617	16,835	13,286	78,870	103,027
Totals.....kilos	8,074	4,491	2,436	9,156	24,157	203,997	54,328	36,447	150,343	445,115	469,272

Compiled by Stowell & Co., Manáos, Brazil.

EXPORTS OF INDIA RUBBER AND CAUCHO FROM MANAOS DURING OCTOBER, 1920

	EUROPE Fine	EUROPE Medium	EUROPE Coarse	EUROPE Caucho	EUROPE Totals	NEW YORK Fine	NEW YORK Medium	NEW YORK Coarse	NEW YORK Caucho	NEW YORK Totals	Grand Totals
Exporters											
General Rubber Co. of Brazil.kilos	146,667	29,182	12,151	.....	188,000	514,856	24,563	60,037	33,544	633,000	821,000
Stowell & Co.	184,863	7,178	6,968	54,001	253,010	10,880	3,040	4,590	.....	18,510	271,520
Tancredo, Porto & Co.	11,831	15	98	5,065	17,009	37,087	13	10,513	13,220	60,833	77,842
B. Lévy & Co.	.....	.....	.....	.....	.....	28,841	1,752	4,172	7,584	42,349	42,349
Ohliger & Co.	9,775	3,816	12,587	9,259	35,437	.....	.....	.....	.....	.....	35,437
Higson & Fall	13,140	.....	4,420	480	18,040	10,135	2,335	330	.....	12,800	30,840
Semper & Co.	4,160	326	5,959	254	10,699	.....	.....	.....	.....	.....	10,699
Companhia Fluvial	4,948	.....	284	1,472	6,704	.....	.....	.....	.....	.....	6,704
Paulo Lévy & Co.	1,356	118	37	.....	1,511	.....	.....	.....	.....	.....	1,511
Totals.....kilos	376,740	40,635	42,504	70,531	530,410	601,799	31,703	79,642	54,348	767,492	1,297,902

Compiled by Stowell & Co., Manáos, Brazil.

RUBBER STATISTICS FOR THE DOMINION OF CANADA

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

August

	1919		1920	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free:*				
Rubber, gutta percha, etc.:				
From United Kingdom	256,494	$110,790	48,620	$22,092
United States	472,119	193,620	309,368	92,019
Brazil	.....	.....	40,000	13,000
British East Indies:				
Straits Settlements	433,500	168,951	235,230	109,923
Other countries	500	177	66,498	36,676
Totals	1,162,613	$473,538	699,716	$273,710
Rubber, recovered	296,476	$49,307	509,455	$79,863
Rubber, powdered, and rubber or gutta percha scrap	345,885	19,790	40,340	4,844
Rubber substitutes	67,300	8,246	212,477	27,878
Totals unmanufactured	1,872,274	$550,881	1,461,988	$386,295
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	5,871	$1,991	7,911	$5,717
Hard rubber tubes	.....	1,652	.....	4,113
Rubber thread, not covered	2,532	3,410	3,873	5,352
Totals, partly manufactured	8,403	$7,053	11,784	$15,182
MANUFACTURED—				
Belting	.....	$7,502	.....	$13,002
Hose	.....	7,667	.....	13,946
Packing	.....	6,498	.....	7,964
Boots and shoes	.....	22,528	.....	11,820
Clothing, including waterproofed	.....	12,885	.....	31,157
Gloves	.....	787	.....	1,045
Hot water bottles	.....	858	.....	731
Tires, solid	.....	22,439	.....	22,201
Tires, pneumatic	.....	94,905	.....	213,803
Tires, inner tubes	.....	16,184	.....	25,014
Other manufactures	.....	187,350	.....	283,051
Totals, manufactured	.....	$379,603	.....	$623,734
Totals, rubber imports	.....	$937,537	.....	$1,025,211
Insulated wire and cables:				
Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$12,283	.....	$36,461
Copper wire and cables covered as above	.....	9,300	.....	68,246
Chicle	217,003	182,584	48,329	23,198

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

August

	1919		1920	
	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED—				
Crude and waste rubber	$24,366	$17,536	$25,275	.....
MANUFACTURED—				
Belting	$647	.....	$9,615	.....
Hose	11,602	.....	23,518	.....
Boots and shoes	172,202	$187	72,937	.....
Clothing, including waterproofed	3,889	12	2,398	.....
Tires, pneumatic	724,474	.....	898,146	.....
Tires, other kinds	3,047	598	1,486	$515
Other manufactures	22,119	2,086	73,235	4,467
Totals, manufactured	$937,980	$2,883	$1,081,335	$4,982
Totals, rubber exports	$962,346	$20,419	$1,106,610	$4,982
Chicle	$114,151	.....	.....	.....

RUBBER STATISTICS FOR THE DOMINION OF CANADA

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

September

	1919		1920	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free:*				
Rubber, gutta percha, etc.:				
From United Kingdom	850,491	$374,266	932,357	$409,416
United States	468,858	194,954	774,341	236,986
British East Indies:				
Ceylon	30,651	17,098	14,442	5,484
Straits Settlements	609,540	264,217	1,338,847	648,735
Totals	1,959,540	$850,535	3,059,987	$1,360,621
Rubber, recovered	180,642	$28,902	215,488	$35,590
Rubber, powdered, and rubber or gutta percha scrap	220,572	16,498	526,972	51,402
Rubber substitutes	53,260	9,255	139,682	19,474
Totals, unmanufactured	2,414,014	$905,190	3,942,129	$1,467,087
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	5,977	$4,493	3,463	$2,525
Hard rubber tubes	.....	3,211	.....	2,492
Rubber thread, not covered	3,469	5,080	1,696	2,382
Totals, partly manufactured	9,446	$12,784	5,159	$7,399
MANUFACTURED—				
Belting	.....	$10,449	.....	$11,006
Hose	.....	7,872	.....	6,498
Packing	.....	5,683	.....	8,205
Boots and shoes	.....	40,106	.....	50,238
Clothing, including waterproofed	.....	14,629	.....	16,129
Gloves	.....	1,526	.....	1,264
Hot water bottles	.....	4,436	.....	2,169
Tires, solid	.....	14,869	.....	16,036
Tires, pneumatic	.....	105,857	.....	140,825
Tires, inner tubes	.....	7,759	.....	16,174
Other manufactures	.....	174,028	.....	231,118
Totals, manufactured	.....	$387,214	.....	$499,662
Totals, rubber imports	2,423,460	$1,305,188	3,947,288	$1,974,148
Insulated wire and cables:				
Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$15,543	.....	$12,581
Copper wire and cables, covered as above	.....	13,363	.....	28,901
Chicle	118,334	93,790	.....	.....

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

September

	1919		1920	
	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED—				
Crude and waste rubber	$52,653	$11,062	$13,896	.....
MANUFACTURED—				
Belting	$14,016	.....	$3,675	.....
Hose	17,983	.....	18,176	.....
Boots and shoes	175,633	$593	99,064	$384
Clothing, including waterproofed	2,413	13	2,562	.....
Tires	987	1,486	946	4,644
Tires, pneumatic	455,847	.....	1,028,458	.....
Other manufactures	17,549	1,113	46,034	5,649
Totals, manufactured	$684,428	$3,205	$1,198,915	$10,677
Totals, rubber exports	$737,081	$14,267	$1,212,811	$10,677
Insulated wire and cable:				
Copper wires and cable	$221	.....	$26,289	.....
Chicle	1,941	.....	1,728	.....

UNITED STATES CRUDE RUBBER IMPORTS FOR 1920 (BY MONTHS)

1920	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Balata	Miscellaneous Gum	Waste	Totals 1920	Totals 1919
January ...tons	17,799	2,620	821	111	....	....	....	....	....	21,351	7,235
February	29,681	2,456	558	265	34	....	....	....	....	32,994	17,456
March	28,533	2,463	514	23	114	3	113	983	1,252	33,998	28,223
April	21,036	1,893	628	29	79	10	22	812	448	24,957	28,146
May	24,443	2,025	662	95	113	....	45	1,059	224	28,666	16,348
June	12,911	1,352	427	27	164	....	7	552	164	15,604	16,319
July	14,695	1,115	34	40	....	....	8	1,283	312	17,487	17,965
August	12,730	590	13	75	156	....	67	1,135	300	15,066	11,067
September	10,974	459	99	8	74	22	44	516	218	12,414	14,036
October	8,759	1,613	27	17	223	....	33	498	425	11,595	28,888
November	13,049	2,230	351	44	....	....	68	27	608	16,377	15,674
Totals, 11 months, 1920	194,610	18,816	4,134	734	957	35	407	6,865	3,951	230,509	....
Totals, 11 months, 1919	170,385	24,880	2,895	1,288	1,478	431	....	....	....	....	201,357

Compiled by The Rubber Association of America, Inc.

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF OCTOBER, 1920

EXPORTED TO—	Belting	Hose	Packing	Boots		Shoes		Soles and	Automobile Tires				Insulated Wire and	Druggists' Rubber	All Other Manufactures	
EUROPE:	Value	Value	Value	Pairs	Value	Pairs	Value	Heels Value	Casings Value	Inner Tubes Value	Solid Tires Value	All Others Value	Cables Value	Sundries Value	of Rubber Value	Totals Value
Austria	.....	.....	.....	.....	.....	.....	.....	.....	$20,566	$1,708	.....	.....	.....	.....	.....	$22,274
Azores and Madeira Islands	.....	.....	.....	.....	.....	.....	.....	.....	60	.....	$180	.....	.....	.....	.....	240
Belgium	.....	.....	.....	.....	.....	600	$992	.....	132,011	16,521	.....	.....	$3,895	.....	$600	154,019
Bulgaria	.....	.....	.....	.....	.....	2,712	3,918	.....	400	142	.....	.....	.....	.....	.....	4,460
Denmark	$4,480	.....	$149	872	$3,270	34,708	29,311	.....	20,216	796	4,200	.....	1,425	.....	1,620	65,467
Finland	3,351	.....	.....	.....	.....	31,800	37,272	.....	5,620	1,800	.....	.....	.....	.....	.....	48,043
France	7,784	180	5,340	.....	.....	14,036	9,934	.....	31,468	708	.....	.....	25,434	$183	41,910	122,941
Germany	.....	38	.....	.....	.....	.....	.....	.....	4,920	1,152	.....	$18	.....	280	.....	6,408
Gibraltar	.....	.....	.....	.....	.....	.....	.....	.....	1,016	128	.....	.....	.....	.....	.....	1,144
Greece	303	.....	.....	.....	.....	.....	.....	$136	40,707	11,058	.....	.....	2,511	344	12,855	67,914
Italy	.....	12	250	.....	.....	6,432	5,000	336	147,621	10,808	346	.....	11,560	480	6,742	183,155
Malta, Gozo and Cyprus Islands	.....	.....	.....	.....	.....	360	378	.....	1,500	.....	.....	.....	.....	44	.....	1,922
Netherlands	474	9,143	.....	.....	.....	18,120	14,541	67	178,700	59,098	.....	937	27,094	3,592	5,052	298,698
Norway	4,063	8,988	104	.....	.....	102,914	92,641	.....	45,463	8,054	27,404	2,343	17,709	1,536	7,109	215,414
Poland and Danzig	.....	.....	.....	.....	.....	1,008	1,206	.....	4,800	.....	.....	.....	.....	.....	.....	6,006
Portugal	120	.....	.....	.....	.....	.....	.....	.....	30,050	73	95	.....	3,453	1,775	1,162	36,728
Roumania	.....	3,167	.....	.....	.....	.....	.....	.....	30,209	336	.....	.....	.....	.....	.....	33,712
Russia in Europe	.....	.....	.....	8	32	.....	.....	.....	516	71	.....	.....	.....	360	150	1,129
Spain	1,800	1,471	109	.....	.....	21,772	21,261	906	142,571	14,426	880	59	1,997	12,984	8,429	206,893
Sweden	4,082	2,673	656	204	612	720	700	.....	20,499	633	300	3,896	7,785	445	2,618	44,899
Switzerland	966	.....	.....	.....	.....	16,207	17,549	.....	10,721	2,122	.....	.....	515	.....	3,853	35,726
Turkey in Europe	.....	258	.....	.....	.....	50,303	62,146	.....	288	50	.....	.....	.....	.....	282	63,024
England	13,217	44,969	8,421	2,484	8,690	55,533	51,733	5,994	338,435	19,476	.....	1,836	37,440	12,602	70,379	613,192
Scotland	3,557	.....	496	1,428	3,825	12,948	11,578	.....	3,511	.....	.....	.....	.....	.....	3,311	26,278
Ireland	.....	.....	.....	.....	.....	980	790	2,540	127	.....	.....	.....	.....	.....	2,414	5,871
Yugoslavia, Albania, etc	.....	.....	.....	.....	.....	.....	.....	.....	1,500	1,509	.....	.....	.....	.....	.....	3,009
TOTALS, EUROPE	$44,197	$70,899	$15,525	4,996	$16,429	371,153	$360,950	$9,979	$1,213,495	$150,669	$33,405	$9,089	$140,818	$34,625	$168,486	$2,268,566
NORTH AMERICA:																
Bermuda	.....	$170	.....	39	$128	738	$1,035	$105	.....	.....	.....	$287	$1,258	$143	$203	$3,329
British Honduras	.....	20	$28	.....	.....	2,014	3,299	.....	$837	$247	.....	.....	.....	6	27	4,464
Canada	$24,481	23,456	9,868	8,637	32,198	10,094	23,840	161	165,951	28,268	$6,327	202	29,519	25,831	169,845	539,947
Costa Rica	.....	310	66	.....	.....	.....	.....	358	610	37	542	24	1,448	1,055	784	5,234
Guatemala	1,945	93	1,189	.....	.....	479	754	1,433	2,263	2,147	59	653	429	22	324	11,311
Honduras	1,745	1,205	791	.....	.....	235	305	274	513	55	254	.....	1,046	253	1,549	7,990
Nicaragua	899	.....	336	50	212	280	372	1,484	4,831	277	482	.....	2,196	58	791	11,938
Panama	1,496	7,141	263	28	102	2,589	4,428	3,400	18,004	3,568	10,491	8,328	30,727	543	2,993	91,484
Salvador	242	26	95	168	200	.....	.....	4,659	4,991	1,185	352	342	8,300	792	310	21,494
Mexico	38,911	81,116	34,716	11	46	24,798	26,774	1,907	167,350	23,392	10,317	2,182	56,911	9,450	51,707	504,779
Miquelon, Langley, etc	.....	.....	.....	600	2,172	192	165	.....	.....	.....	.....	.....	.....	.....	.....	2,337
Newfoundland and Labrador	381	250	.....	4,767	16,841	729	388	728	575	.....	.....	879	.....	.....	1,692	21,734
Barbados	.....	.....	.....	.....	.....	681	1,164	315	3,847	606	.....	.....	469	3	163	6,567
Jamaica	284	1,514	725	.....	.....	6,165	8,868	1,457	34,413	2,764	5,274	269	591	358	1,220	57,737
Trinidad and Tobago	194	365	1,039	.....	.....	6,661	6,674	.....	10,256	4,323	720	.....	1,260	250	986	26,067
Other British West Indies	476	191	3	.....	.....	1,422	1,462	5	25,848	2,628	296	$13	709	96	352	32,579
Cuba	19,007	50,199	35,369	12	85	84,753	84,179	16,933	491,632	58,781	11,865	14,803	63,302	30,837	50,202	927,194
Virgin Islands of United States	.....	1,471	109	.....	.....	639	1,065	560	2,300	672	.....	.....	.....	59	15	6,251
Dutch West Indies	13	23	13	.....	.....	2,073	2,483	5	997	136	.....	.....	.....	114	65	3,849
French West Indies	1,415	518	20	.....	.....	.....	.....	.....	3,874	590	2,595	.....	1,674	.....	35	10,721
Haiti	13	98	.....	.....	.....	487	742	3,411	8,650	1,761	.....	.....	388	58	374	15,495
Dominican Republic	1,078	847	543	.....	.....	2,824	3,664	319	24,740	1,773	2,456	887	12,874	1,265	2,722	53,168
TOTALS, NORTH AMERICA	$92,580	$169,013	$85,173	14,312	$51,984	147,853	$171,661	$37,514	$972,482	$133,210	$52,030	$29,369	$213,101	$71,193	$286,359	$2,365,669
OCEANIA:																
Australia	$1,212	$5,846	$3,478	384	$1,576	2,463	$2,178	$24	$159,885	$15,152	$8,780	$6,256	$3,492	$7,064	$19,015	$233,958
New Zealand	11,544	6,305	2,805	144	1,142	1,942	2,551	4,079	167,951	9,666	15,201	2,531	16,442	1,935	26,591	268,743
Other British Oceania	.....	.....	.....	.....	.....	226	402	.....	643	63	.....	.....	.....	.....	.....	1,108
French Oceania	86	38	.....	.....	.....	1,580	2,211	.....	1,115	215	.....	61	.....	75	.....	3,801
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	42	42
Philippine Islands	12,702	9,697	15,591	.....	.....	22,747	32,132	21,320	195,255	31,511	11,281	12,554	14,799	3,131	19,556	379,529
TOTALS, OCEANIA	$25,544	$21,886	$21,874	528	$2,718	28,958	$39,474	$25,423	$524,849	$56,607	$35,262	$21,402	$34,733	$12,205	$65,204	$887,181
SOUTH AMERICA:																
Argentina	$6,940	$5,766	$2,685	.....	.....	14,440	$14,969	$900	$196,511	$20,865	$3,405	$4,698	$7,161	$6,174	$38,827	$308,901
Bolivia	1,282	108	.....	19	$93	7	9	.....	3,712	189	.....	.....	150	91	358	5,992
Brazil	20,797	15,994	2,356	7	35	18,140	18,954	6,101	153,278	17,156	674	9	54,131	6,726	20,924	317,135
Chile	22,412	17,319	1,661	.....	.....	3,543	3,908	17	43,232	7,981	1,201	1,496	40,786	2,217	14,399	156,629
Colombia	594	2,260	891	.....	.....	1,746	2,065	421	10,847	2,400	2,416	89	9,796	4,427	5,604	41,810
Ecuador	.....	1,419	858	.....	.....	1,352	1,530	700	4,545	1,090	.....	195	336	1,023	904	12,600
British Guiana	.....	230	.....	.....	.....	6,260	9,141	.....	1,257	125	50	.....	135	48	674	11,660
Dutch Guiana	.....	124	.....	.....	.....	.....	.....	.....	144	.....	.....	.....	.....	.....	6	274
French Guiana	.....	.....	.....	.....	.....	.....	.....	.....	75	.....	.....	.....	.....	.....	.....	75
Paraguay	163	.....	.....	.....	.....	120	167	.....	.....	.....	.....	.....	336	.....	.....	499
Peru	1,917	9,206	5,555	324	2,699	3,312	2,671	2,213	20,755	3,570	.....	273	25,181	1,223	3,547	74,093
Uruguay	.....	1,518	.....	.....	.....	96	108	581	31,398	7,400	.....	.....	175	1,231	5,289	51,895
Venezuela	2,096	968	451	.....	.....	.....	.....	.....	24,998	3,976	249	.....	7,899	3,209	3,292	47,827
TOTALS, SOUTH AMERICA	$56,201	$54,912	$14,457	350	$2,827	49,016	$53,522	$10,933	$490,752	$64,752	$7,995	$6,760	$146,086	$26,369	$93,824	$1,029,390

	$10,933	$490,752	$64,752	$7,995	$6,760	$146,086	$26,369	$93,824	$1,029,390

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Automobile Tires: Soles and Heels Value	Automobile Tires: Casings Value	Automobile Tires: Inner Tubes Value	Automobile Tires: Solid Tires Value	Automobile Tires: All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
ASIA:																
China	$4,238	$1,581	$296	36	$200	1,944	$2,167	$806	$38,625	$1,830	$150	$134	$34,080	$3,441	$4,524	$92,072
Chosen	187	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	.....	.....	.....	219
British India	790	804	2,356	.....	.....	4,403	6,874	39	118,060	14,036	8,000	.....	1,123	3,972	6,976	163,030
Straits Settlements	.....	1,276	.....	.....	.....	4,633	5,213	.....	27,885	3,364	12,174	.....	50	2,259	1,808	54,029
Other British East Indies	.....	.....	.....	.....	.....	480	616	.....	9,431	682	.....	.....	.....	.....	153	10,882
Dutch East Indies	.....	28,037	1,739	.....	.....	387	515	.....	83,707	2,010	10,835	3,636	1,839	578	1,825	134,721
French Indo China	10,460	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	73	10,533
Hongkong	.....	.....	362	.....	.....	744	1,358	.....	1,851	1,184	1,752	.....	.....	26	2,310	8,843
Japan	3,116	8,925	14,309	4,740	8,812	23,830	25,307	121	4,648	168	.....	88	1,943	292	6,420	74,149
Persia	.....	.....	.....	.....	.....	16,674	12,000	.....	2,459	$50	.....	.....	.....	.....	.....	15,009
Russia in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Siam	263	.....	.....	.....	.....	224	230	.....	.....	.....	.....	.....	.....	.....	27	27
Turkey in Asia	.....	137	.....	.....	.....	10,219	12,447	572	9,957	2,418	.....	157	.....	.....	.....	650
														57	410	25,998
TOTALS, ASIA	$19,054	$40,760	$19,062	4,776	$9,012	63,538	$66,727	$1,538	$296,623	$26,242	$32,911	$4,047	$39,035	$10,625	$24,526	$590,162
AFRICA:																
British West Africa	.....	$34	.....	.....	.....	126	$242	.....	$35,922	$4,833	$434	$45	.....	.....	$100	$41,610
British South Africa	$46,382	37,268	$26,312	.....	.....	5,968	6,276	$437	226,409	20,865	2,816	1,321	$696	$1,097	52,147	422,026
British East Africa	.....	.....	.....	.....	.....	336	322	.....	13,564	970	222	.....	189	5	66	15,338
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65	92	157
French Africa	.....	.....	.....	.....	.....	.....	.....	.....	503	20	560	.....	383	.....	1,955	3,421
Kamerun, etc.	.....	3,366	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,366
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	2,088	.....	.....	.....	.....	.....	.....	2,088
Portuguese Africa	.....	1,266	573	.....	.....	.....	.....	.....	644	34	.....	.....	.....	.....	159	2,676
Egypt	.....	220	.....	.....	.....	.....	.....	956	12,488	1,288	1,697	.....	.....	.....	192	16,841
TOTALS, AFRICA	$46,382	$42,154	$26,885	.....	.....	6,430	$6,840	$1,393	$291,618	$28,010	$5,729	$1,366	$1,268	$1,167	$54,711	$507,523
TOTAL	$283,958	$399,624	$182,976	24,962	$82,970	666,948	$699,174	$86,780	$3,789,819	$459,490	$167,332	$72,033	$575,041	$156,184	$693,110	$7,648,491

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF UNITED STATES

	Belting, Hose and Packing Value	Boots and Shoes: Pairs	Boots and Shoes: Value	Tires: Automobile Value	Tires: All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
Hawaii	$34,145	.....	.....	$147,748	$5,764	.....	.....	$26,442	$214,099
Porto Rico	7,747	.....	.....	139,299	635	.....	.....	85,050	232,731
TOTALS	$41,892	.....	.....	$287,047	$6,399	.....	.....	$111,492	$446,830

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	1919 Pounds	1919 Value	September 1920 Pounds	September 1920 Value
UNMANUFACTURED—*free:*				
India rubber:				
From France	46,986	$31,576	307,383	$141,034
From Netherlands	2,923,810	1,237,056	947,073	338,434
United Kingdom	42,900	19,555	.....	.....
Canada	46,196	14,888	4,124	901
Central America	39,353	12,232	.....	.....
Mexico	8,147,297	2,495,311	1,509,440	410,833
Brasil	79,177	32,108	233,993	60,835
Peru	291,289	133,448	135,633	36,590
Other South Am.	14,091,078	5,588,391	17,558,092	7,048,561
British E. Indies	4,359,356	1,739,439	5,977,766	2,423,550
Dutch E. Indies	726,248	145,455	1,710,244	496,686
Other countries				
Totals	30,792,822	$11,449,459	27,883,748	$10,957,854
Balata	180,335	$123,654	894,115	$380,143
Guayule	1,340,082	$126,083	506,420	$31,466
Jelutong (Pontianak)	286,039	48,840	563,742	96,754
Gutta percha	1,275,699	145,165	235,000	47,000
Rubber scrap	56,666	14,160	466,480	72,155
	976,924	72,872	308,389	51,207
			854,736	42,046
Totals, unmanufactured	2,489,624	$355,851	2,758,720	$592,551
Chicle (dutiable)	503,032	343,497	257,938	170,774
MANUFACTURED—*dutiable:*				
India rubber and gutta percha	.....	224,812	.....	245,017
India rubber substitutes	112	98	.....	.....

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED—				
India rubber:				
Scrap and old	1,340,082	$126,083	506,420	$31,466
Reclaimed	286,039	48,840	563,742	96,754
Belting[1]	.....	.....	.....	258,063
Hose[1]	.....	.....	414,814	319,445
Packing[1]	.....	.....	.....	136,375
Boots[1] *pairs*	28,542	75,659	26,489	92,216
Shoes[1] *pairs*	702,744	631,150	851,191	819,853
Soles and heels[1] *pairs*	.....	.....	.....	77,494
Tires:				
For automobiles[1]	.....	.....	.....	3,883,923
Casings[1]	2,120,477	.....	.....	446,352
Inner tubes[1]	.....	.....	.....	271,572
Solid tires[1]	.....	.....	136,907	78,597
All other tires[1]	.....	.....	108,929	137,400
Druggists' rubber sundries[1]	.....	.....	239,224	409,542
Suspenders and garters	.....	.....	.....	.....
Other rubber manufactures[1]	.....	.....	650,809	613,921
Totals, manufactured	.....	.....	.....	$7,672,975
Fountain pens...*number*	47,971	$4,552,892	.....	$25,772
Insulated wire and cables[1]	.....	$43,816	19,018	95,986
	.....	91,881	.....	
UNMANUFACTURED—				
India rubber	503,587	$219,675	1,339,013	$395,374
Balata	3,712	2,789	17,920	13,762
Jelutong (Pontianak)	.....	.....	2,240	582
Rubber scrap	.....	.....	1,630	425
Totals, unmanufactured	507,299	$222,464	1,360,803	$410,143
MANUFACTURED—				
Gutta percha	.....	$5,546	.....	$2,071
Totals, manufactured	.....	$5,546	.....	$2,071

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES

MANUFACTURED—		
To Alaska:		
Belting, hose and packing	$5,561	$8,708
Boots and shoes...*pairs*	14,483	17,001
Other rubber goods	6,491	10,221
Totals	$26,535	$35,930
To Hawaii:		
Belting, hose and packing	$3,540	$10,262
Automobile tires	86,649	88,807
Other tires	1,043	3,742
Other rubber	13,880	12,992
Totals	$105,112	$115,803
To Porto Rico:		
Belting, hose and packing	$4,703	$7,400
Automobile tires	82,454	75,107
Other tires	468	2,358
Other rubber goods	16,807	31,251
Totals	$104,432	$116,116
To Philippine Islands—treated as foreign commerce.		

[1]Details of exports of domestic merchandise by countries during September, 1920, were given on pages 224-225 of our December issue.

RUBBER STATISTICS FOR ITALY

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	Six Months Ended June			
	1919		1920	
	Quintals[1]	Lire[2]	Quintals	Lire
UNMANUFACTURED—				
Crude rubber and gutta percha—raw and reclaimed:				
From Great Britain	.....	60,867,450	185	30,552,950
French Asian Colonies	97		2,075	
India and Ceylon	18,101		3,659	
Straits Settlements	24,948		15,119	
French African Colonies	2,487		578	
Belgian Congo	574		1,184	
Brazil	16,948		9,075	
Other countries	916		286	
Totals	64,071	60,867,450	32,161	30,552,950
Rubber scrap	8,584	1,287,600	136	20,400
Totals, unmanufactured	72,655	62,155,050	32,297	30,573,350
MANUFACTURED—				
India rubber and gutta percha—				
Threads	152	440,800	197	571,300
Sheets, including hard rubber	98	197,400	90	177,900
Tubes	88	125,450	114	242,500
Belting	254	419,100	489	806,850
Rubber-coated fabrics ....*pieces*	343	731,000	489	952,600
Boots and shoes.....*pairs*	12,980	259,600	75,578	1,511,560
Elastic webbing	247	839,800	282	958,800
Clothing and articles for travel	2	8,000	114	45,600
Tires and tubes—				
From Belgium	.....	8,940,400	632	23,377,200
France	2,729		2,485	
Great Britain	461		4,067	
United States	2		1,140	
Other countries	1		25	
Other manufactures	10,010	18,828,100	11,844	22,105,300
Totals, manufactured	.....	30,789,650	.....	50,749,610
Total imports	.....	92,944,700	.....	81,322,960

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To Austria	.....	1,646,000	300	1,892,500
Spain	1,922		622	
United States	1,370		2,340	
Other countries	.....		523	
Totals	3,292	1,646,000	3,785	1,892,500
Rubber scrap	100	20,000	5,638	1,127,600
Totals, unmanufactured	3,392	1,666,000	9,423	3,020,100
MANUFACTURED—				
India rubber and gutta percha—				
Threads	180	558,000	194	601,400
Sheets, including hard rubber	49	108,200	196	356,800
Tubes	487	711,150	940	1,207,550
Belting	95	199,500	.....	.....
Rubber-coated fabrics ....*pieces*	98	294,000	203	602,600
Boots and shoes.....*pairs*	.....	.....	445	8,900
Other footwear	.....	.....	2	3,000
Elastic webbing	363	1,379,400	747	2,838,600
Clothing and articles for travel	4	20,000	291	1,455,000
Tires and tubes—				
To Austria	50	15,177,500	1,407	66,510,000
Belgium	700		830	
Czecho-Slovakia	252		546	
Denmark	84		981	
France	225		1,256	
Great Britain	1,644		6,336	
Netherlands	28		366	
Rumania	.....		670	
Spain	261		346	
Switzerland	13		362	
Hungary	.....		233	
India and Ceylon	545		3,637	
Netherland East Indies	.....		1,444	
Straits Settlements	140		1,436	
Australia	242		611	
Argentina	635		1,854	
Brazil	462		1,405	
Other countries	790		2,888	
Other manufactures	940	1,771,800	6,755	12,474,000
Total, manufactured	.....	20,219,550	.....	86,057,850
Total exports	.....	21,885,550	.....	89,077,950

[1] One quintal equals 220.46 pounds.
[2] One lira equals $0.193 (normal).

RUBBER STATISTICS FOR ITALY

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	Five Months Ended May			
	1919		1920	
UNMANUFACTURED—	Quintals[1]	Lire[2]	Quintals	Lire
Crude rubber and gutta percha—raw and reclaimed:				
From Great Britain	.....	56,370,150	169	18,546,850
India and Ceylon	18,101		3,241	
Straits Settlements	23,131		6,577	
French African Colonies	1,425		578	
Belgian Congo	574		875	
Brazil	15,190		5,783	
Other countries	916		2,300	
Totals	59,337	56,370,150	19,523	18,546,850
Rubber scrap	988	148,200	136	20,400
Totals, unmanufactured	60,325	56,518,350	19,659	18,567,250
MANUFACTURED—				
India rubber and gutta percha—				
Threads	123	356,700	156	452,400
Sheets, including hard rubber	86	167,400	60	109,700
Tubes	75	104,150	82	193,100
Belting	178	293,700	330	544,500
Rubber-coated fabrics..*pieces*	260	561,600	370	715,600
Boots and shoes.....*pairs*	12,043	240,860	58,106	1,162,120
Elastic webbing	89	302,600	186	632,400
Clothing and articles for travel	1	4,000	105	420,000
Tires and Tubes—				
From Belgium	.....	7,229,600	632	15,640,800
France	2,283		1,806	
Great Britain	298		2,358	
United States	.....		782	
Other countries	1		8	
Other goods	7,584	14,285,600	8,385	15,611,500
Totals, manufactured	.....	23,546,210	.....	35,482,120
Total imports	.....	80,064,560	.....	54,049,370

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To Austria	.....	1,480,500	300	1,459,500
Spain	1,830		468	
United States	1,131		1,867	
Other countries	.....		284	
Totals	2,961	1,480,500	2,919	1,459,500
Rubber scrap	.....	.....	3,839	767,800
Totals, unmanufactured	2,961	1,480,500	6,758	2,227,300
MANUFACTURED—				
India and rubber gutta percha—				
Threads	137	424,700	153	474,300
Sheets, including hard rubber	41	92,300	121	224,300
Tubes	341	492,350	689	864,600
Belting	94	197,400	.....	.....
Rubber-coated fabrics.....*pieces*	56	168,000	109	320,600
Boots and shoes.....*pairs*	.....	.....	445	8,900
Other footwear	.....	.....	1	1,500
Elastic webbing	320	1,216,000	562	2,135,600
Clothing and articles for travel	1	5,000	202	1,010,000
Tires and tubes:				
To Austria	50	11,882,500	1,195	46,387,500
Belgium	698		475	
Czecho-Slovakia	.....		468	
Denmark	76		620	
France	170		701	
Great Britain	1,493		4,540	
Netherlands	28		222	
Rumania	.....		610	
Spain	7		139	
Switzerland	7		325	
Hungary	.....		216	
India and Ceylon	488		2,586	
Dutch East Indies	.....		1,444	
Straits Settlements	140		925	
Australia	241		406	
Argentina	431		1,407	
Brazil	419		1,259	
Other countries	505		1,021	
Other rubber goods	741	1,399,600	4,447	8,282,000
Totals, manufactured	.....	15,877,850	.....	59,709,300
Total exports	.....	17,358,350	.....	61,936,600

[1] One quintal equals 220.46 pounds.
[2] One lira equals $0.193 (normal).

UNITED KINGDOM RUBBER STATISTICS

IMPORTS

	October 1919 Pounds	October 1919 Value	October 1920 Pounds	October 1920 Value
UNMANUFACTURED—				
Crude rubber:				
From—				
Straits Settlements	7,831,900	£809,345	8,011,000	£602,390
Federated Malay States	9,999,400	1,009,367	6,699,800	523,362
British India	253,100	25,178	747,100	56,787
Ceylon and dependencies	1,537,000	160,225	5,403,300	417,758
Other Dutch possessions in Indian Seas	1,444,300	144,863	996,600	79,818
Dutch East Indies (except other Dutch possessions in Indian Seas)	379,800	41,749	811,800	58,209
Other countries in the East Indies and Pacific not elsewhere specified	511,700	50,908	300,400	22,971
Brazil	437,500	44,823	1,462,600	104,272
Peru	111,400	11,040	.....	.....
South and Central America (except Brazil and Peru)	74,500	7,756	86,200	6,105
West Africa:				
French West Africa	.....	.....	9,500	602
Gold Coast	9,400	607	34,200	2,904
Other parts of West Africa	25,500	1,935	40,400	2,560
East Africa (including Madagascar)	94,200	8,956	69,200	5,189
Other countries	198,300	18,198	58,900	4,236
Totals	22,908,000	£2,334,950	24,731,000	£1,887,163
Waste and reclaimed rubber	689,400	21,271	571,400	13,331
Totals, unmanufactured	23,597,400	£2,356,221	25,302,400	£1,900,494
Gutta percha and balata	1,615,400	£290,895	363,100	£113,439
*Rubber substitutes	.....	.....	13,300	777
MANUFACTURED—				
Boots and shoes...*dozen pairs*	20,805	£33,731	27,627	£77,443
Waterproofed clothing	.....	3,506	.....	2,257
Insulated wire	.....	381	.....	1,626
Submarine cables	.....	38	.....	.....
Tires and tubes	.....	208,296	.....	488,580
Other rubber manufactures	.....	58,001	.....	81,466

EXPORTS

UNMANUFACTURED—				
Waste and reclaimed rubber	1,120,900	£26,431	910,200	£24,474
Rubber substitutes	.....	.....	136,800	6,269
Totals	1,120,900	£26,431	1,047,000	£30,743
MANUFACTURED—				
Boots and shoes..*dozen pairs*	14,981	£32,736	17,593	£40,774
Waterproof clothing	.....	189,365	.....	278,589
Insulated wire	.....	81,709	.....	149,492
Submarine cables	.....	46,292	.....	144,411
Tires and tubes	.....	300,238	.....	504,053
Other rubber manufactures	.....	228,289	.....	425,435

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED—				
Crude rubber:				
To Russia	.....	.....	1,000	£94
Sweden, Norway and Denmark	457,800	£52,062	93,700	8,303
Germany	961,400	84,083	1,218,000	84,536
Belgium	498,400	48,141	128,900	11,207
France	1,688,900	175,095	1,037,300	84,345
Spain	54,900	5,959	24,000	2,005
Italy	214,800	23,652	114,800	10,000
Austria-Hungary	16,300	1,940	144,300	11,591
Other European countries	788,000	76,508	259,500	23,924
United States	16,131,200	1,687,931	74,300	5,518
Canada	1,183,700	134,245	100,600	6,375
Other countries	51,400	6,488	50,600	4,247
Totals, rubber	22,046,800	£2,296,104	3,247,000	£252,145
Waste and reclaimed rubber	14,000	700	1,800	90
Gutta percha and balata	68,700	11,759	66,500	11,570
MANUFACTURED—				
Boots and shoes.*dozen pairs*	90	£449	269	£1,390
Waterproof clothing	.....	5	.....	.....
Tires and tubes	.....	8,656	.....	5,827
Insulated wire	.....	975	.....	.....
Other manufactures	.....	3,695	.....	2,863
Totals, manufactured	.....	£13,780	.....	£10,080

*Included in "Other Articles," Class III, T., prior to 1920.

THE MARKET FOR RUBBER SCRAP

NEW YORK

TRADE in rubber scrap is at the lowest ebb. There is no market and virtually nothing doing. Reclaimers have no need for stocking scrap, which is, in fact, so nearly without market value that its collection scarcely repays the labor involved. Those holding scrap entertain the hope that in time crude rubber prices may advance and the scrap rubber and reclaiming business revive together in consequence. The following quotations are nominal:

QUOTATIONS FOR CARLOAD LOTS DELIVERED

Prices subject to change without notice

DECEMBER 27, 1920

BOOTS AND SHOES:			
Arctic tops	lb	*$0.07½ @	
Boots and shoes	lb	*.05½ @	.05¾
Trimmed arctics	lb.	*.04¾ @	.05¼
Untrimmed arctics	lb.	*.03¼ @	.04¾
HARD RUBBER:			
Battery jars, black compound	lb	*.01 @	.01¼
No. 1, bright fracture	lb.	*.23 @	.24
INNER TUBES:			
No. 1	lb.	*.09½ @	.10½
Compounded	lb.	*.05½ @	.06½
Red	lb.	*.05 @	.06
MECHANICALS:			
Black scrap, mixed, No. 1	lb	*.03½ @	.04
No. 2	lb.	*.02½ @	.02¾
Car springs	lb.	*.03½ @	.04
Heels	lb.	*.03 @	.03½
Horse-shoe pads	lb.	*.03 @	.03½
Hose, air brake	lb.	*.03½ @	.03¾
fire, cotton lined	lb	*.01½ @	.01¾
garden	lb.	*.01½ @	.01¾
Insulated wire stripping, free from fiber	lb.	*.03½ @	.04
Matting	lb.	*.01¼ @	.01½
Red packing	lb.	*.05½ @	.06
Red scrap, No. 1	lb.	*.09 @	.10
No. 2	lb.	*.06¾ @	.07¼
White scrap, No. 2	lb.	*.08 @	.09
No. 1	lb	*.10 @	.11
TIRES:			
PNEUMATIC—			
Auto peelings	lb.	*.03¾ @	.04¼
Bicycle	lb.	*.02¼ @	.02¾
Standard white auto	lb.	*.02½ @	.03½
Mixed auto	lb	*.01¼ @	.02¼
Stripped, unguaranteed	lb.	*01 @	.02½
White, G. & G., M. & W., and U. S.	lb.	*.03 @	.03¼
SOLID—			
Carriage	lb.	*.03 @	.03¼
Irony	lb.	@	
Truck	lb.	*.02½ @	.02¾

*Nominal.

THE MARKET FOR COTTON AND OTHER FABRICS

NEW YORK

ABSENCE of demand from consumers featured last month's market for American cotton, and prices declined in sympathy with all other raw materials used by the rubber trade. On December 1 middling uplands was quoted 16.65 cents for spot, compared with 39.50 cents last year. With minor fluctuations and a generally weak undertone the market continued to decline and on December 28, middling uplands spot was quoted 14.50 cents, compared with 39.25 cents a year ago.

ARIZONA COTTON. This market was very quiet during the past month and prices lower, No. 2 Pima being nominally quoted at 35 to 40 cents.

EGYPTIAN COTTON. Egyptians were very dull and the market weak with a sagging tendency. Prices quoted were 18 to 23 cents for Uppers and 28 to 35 cents for Sakel, all nominal quotations.

SEA ISLAND COTTON. There was very little interest shown in this market. Average extra choice was nominally quoted at 45 cents.

DUCKS, DRILLS AND OSNABURGS. While a better market condition was indicated by a more general inquiry, the actual business transacted in these goods was negligible. Prices have not declined.

RAINCOAT FABRICS. Quiet has ruled in this market even in view of the prevailing low prices. Sales during the month were

extremely small, and unimportant. There is no prospect of real business in raincoat fabrics before March 1.

TIRE FABRICS. Fabric mills continue to withhold quotations in view of the absence of tire makers' demand, and the speculative trading in stocks held by second hands. Normal demand is not expected to materialize until tire manufacturing again resumes in order to meet the spring demand for tires. The tire fabric prices quoted in the following list are those of August 1, 1920:

NEW YORK QUOTATIONS

DECEMBER 27, 1920

Prices subject to change without notice

ASBESTOS CLOTH:			
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	*lb.*		
2¼ lbs. sq. yd., brass or copper insertion	*lb.*		
BURLAPS:			
32—7-ounce	*100 yards*		
32—8-ounce			
40—7½-ounce		$5.00	
40—8-ounce		5.00	
40—10-ounce		5.25	
40—10½-ounce		5.50	
45—7½-ounce		5.75	
45—8-ounce		5.75	
48—10-ounce			
DRILLS:			
38-inch 2.00-yard	*yard*	.22½@	.23½
40-inch 2.47-yard		.18¼@	.19
52-inch 1.90-yard		.23¼@	.24¼
52-inch 1.95-yard		.23 @	.24¼
60-inch 1.52-yard		.29¼@	.30¼
DUCK:			
CARRIAGE CLOTH:			
38-inch 2.00 yard enameling duck	*yard*	.23½@	
48-inch 1.74-yard		.27 @	
72-inch 16.66-ounce		.63½@	
72-inch 17.21-ounce		.66¼@	
MECHANICAL:			
Hose	*pound*	.43 @	
Belting		.43 @	
HOLLANDS, 40-INCH:			
Acme	*yard*		
Endurance			
Penn			
OSNABURGS:			
40-inch 2.35-yard	*yard*		
40-inch 2.48-yard			
37½-inch 2.42-yard			
RAINCOAT FABRICS:			
COTTON:			
Bombazine 64 x 60	*yard*	.12½@	
60 x 48		.11½@	
Cashmeres, cotton and wool, 36-inch, tan		.85 @	
Twills 64 x 72		.20 @	
64 x 102		.23 @	.24
Twill, mercerized, 36-inch, blue and black		.30 @	
tan and olive		.27½@	
Tweed		.40 @	1.00
printed		.22½@	
Plaids 60 x 48		.12½@	
56 x 44		.12 @	
Repp		.30 @	.35
Prints 60 x 48		.13 @	
64 x 60		.14 @	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES:			
63-inch, 3¼ to 7½ ounces	*yard*	.81 @	2.22
36-inch, 2¾ to 5 ounces		.63 @	1.62
IMPORTED PLAID LINING (UNION AND COTTON):			
63-inch, 2 to 4 ounces	*yard*	.71 @	1.57
36-inch, 2 to 4 ounces		.44 @	.84
SHEETINGS, 40-INCH:			
48 x 48, 2.35-yard	*yard*	.15 @	
48 x 48, 2.50-yard		.13½@	
48 x 48, 2.85-yard		.10¾@	
64 x 68, 3.15-yard		.13½@	.14
56 x 60, 3.60-yard		.10 @	
48 x 44, 3.75-yard		.09½@	
SILKS:			
Canton, 38-inch	*yard*	$0.35 @	
Schappe, 36-inch		.60 @	
STOCKINETTES:			
SINGLE THREAD:			
3½ Peeler, carded	*pound*	@	
4½ Peeler, carded		.55 @	
6½ Peeler, combed		.85 @	
DOUBLE THREAD:			
Zero Peeler, carded	*pound*	.45 @	
3½ Peeler, carded		.52½@	
6½ Peeler, combed		@	
TIRE FABRICS:			
BUILDING:			
17¼-ounce Sakellarides, combed	*pound*	*2.35 @	
17¼-ounce Egyptian, combed		*2.15 @	
17¼-ounce Egyptian, carded		*2.05 @	
17¼-ounce Peelers, combed		*2.25 @	
17¼-ounce Peelers, carded		*1.47 @	
CORD:			
15-ounce Egyptian	*pound*	*2.40 @	
BICYCLE:			
8-ounce American	*pound*	*1.50 @	
10-ounce American		*1.48 @	
CHAFER:			
9¼-ounce Sea Island	*pound*	@	
9¼-ounce Egyptian, carded		*2.29 @	
9¼-ounce Peeler, carded		*1.71 @	

* Nominal.

TIRE
FABRICS

JENCKES
SPINNING
COMPANY

PAWTUCKET
RHODE ISLAND

AKRON OFFICE
Second National Building

NEW YORK OFFICE
25 West 43d Street

NATIONAL AUTOMOBILE SHOW IN NEW YORK

The twenty-first national automobile show will be held at Grand Central Palace, New York City, January 8-15, inclusive. It is expected that it will be the most successful as well as the most important yet held, and 30,000 dealers have been invited to attend. The annual dinner of the National Automobile Chamber of Commerce will be served at Hotel Commodore, Tuesday evening, January 11, while the motor truck committee of the Chamber will hold one of its most important meetings Wednesday following.

The National Automobile Show in Chicago will be held at the Coliseum and Armory the week of January 29 to February 5.

STORING AND PACKING GAS BLACK[1]

In commercial practice there are four different processes of manufacturing carbon black from natural gas, namely, the channel,[2] the small rotating disk, the roller or rotating cylinder, and the large plate processes. The main differences of these methods are in the size and shape of the surface upon which the carbon is collected and the rate at which the moving devices actuate. The channel process is probably the best method and is the most extensively used. The production of carbon black by cracking or thermal decomposition methods is not extensive.

STORAGE BINS AND PACKERS

The storage bins are made of galvanized iron and vary in size. They are hopper shaped and located over the packers.

The packers are very similar to those used in sugar refineries, and are connected to the storage bins by spouts. An auger works inside of a tight sheet steel tube, pressing the carbon into a paper sack. The auger is so designed as to stop the waste of the free-flowing stock running out past the blades of the auger when the packer is stopped for changing sacks. The stock when passing through the auger, keeps the hinged gates folded parallel to and against the top auger blades. When the auger stops, the coil springs force the gates downward against the carbon lodged between the blades, not closing the passageway completely, but holding back the carbon sufficiently to prevent leakage. The machine is gaged to pack a uniform amount in each sack, which is usually 12½ pounds, or a quarter of a barrel. In some cases, especially for export trade, the sacks contain 15 pounds. The packer stops automatically when the sack has been filled with 12½ pounds of carbon black.

The sacks are tied, and in most plants slightly compressed. The compressor consists of a steel plate box, in which a plunger, actuated by a crank shaft or eccentric, travels. The sides of the sack are flattened to facilitate storing and transporting. After compressing, another paper sack is placed over the package.

[1]Abstract from advance report of the Bureau of Mines, published by permission of the Director.

[2]THE INDIA RUBBER WORLD, June 1, 1920, page 581.

"SKOGUM" JAR RINGS OF RED RUBBER

A new high-grade red rubber jar ring is called the "Skogum." The makers claim it has passed the highest test ever given a rubber ring. It is attractively packed in cartons showing a scene on a rubber plantation.—Smalley, Kivlan & Onthank, 21 Blackstone street, Boston, Massachusetts.

"CARMOJON DE-LUXE" INNER TUBES

Pure plantation Pará is used in "Carmojon De-Luxe" tubes, which are made in three colors, brown, red and green. The makers claim a special point of quality for each letter of the name.—Carlisle Tire & Rubber Co., Carlisle, Pennsylvania.

A DISPATCH FROM THE AMERICAN CONSUL AT ALEXANDRIA DATED November 10, 1920, states that the new cotton crop for Egypt has been estimated at 612,000,000 pounds.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS

NEW YORK

THE continued curtailed production of rubber goods of every sort, particularly of automobile tires, has reduced activity in the market for compounding ingredients very appreciably.

In some cases, notably lithopone, production has been decreased owing to lack of demand, which has also not responded to price reductions in this and other ingredients. Prices on lithopone for the first quarter of 1921 were announced early in December and are quoted at 7¾ to 8 cents, an advance of ¼-cent in anticipation of increased spring demand by the paint-consuming trade and rubber-manufacturing industry.

Decreased manufacturing activity in all branches of industry has minimized the demand for raw materials of every sort, but rubber manufacturers in common with those in other lines are optimistic of a marked renewal of business by the spring months of 1921.

ANILINE OIL. Prices declined from 25 cents to 22 cents toward the close of December, with the market weak and dull.

BARYTES. This material is in good supply, little demand and steady prices.

BLANC FIXE. The same conditions prevail as with barytes.

BENZOL. Prices fell off during the past month until they were quoted at 28 cents for 90 per cent in tank cars, or 31 cents in drums. And at 30 cents in tank cars for pure, or 36 to 38 cents in drums.

BLACKS. The prices held steady at the usual figures regardless of the fact that in Wyoming strenuous efforts are being made against the use of natural gas for the manufacture of carbon black.

CHINA CLAY. Foreign arrivals are said to be coming freely and the market is well supplied.

CARBON BISULPHIDE. The market is dull, with prices quoted at 8 to 9 cents per pound.

CARBON TETRACHLORIDE. Little demand in evidence. Quotations are 10½ to 13 cents per pound.

LITHARGE. Slight changes in price occurred during the month of December, notably ½ cent per pound reduction for litharge in casks, which did not affect that in kegs.

LITHOPONE. Stocks are not large and some producers have reduced their volume of output in the absence of active demand, notably from automobile tire manufacturers.

SUBLIMED LEAD. Equally dull with the market for litharge. The price level is maintained at 8½ to 8¾ cents per pound.

SULPHUR. The demand is moderate. Price on commercial grade flour has been reduced to $1.60 from $1.95 per hundred weight, and on the superfine flour from $2.75 to $2.10 per hundred weight.

SOLVENT NAPHTHA. This is not much in demand and is cheaper at 28 to 30 cents.

TALC. The demand is fair, with prices steady.

WHITING. Good receipts of chalk are arriving and the demand continues steady.

ZINC OXIDE. Although the market is dull, producers are still operating mills at full capacity. Lead-free oxide advanced from 10 to 10¼ cents per pound.

NEW YORK QUOTATIONS

December 27, 1920

Prices subject to change without notice

ACCELERATORS, ORGANIC				
Accelerene (New York)	lb.	$4.75	@	
Accelemal	lb.	*.60	@	.65
Aldehyde ammonia crystals	lb.	1.75	@	1.80
Aniline oil	lb.	.30	@	
Excellerex	lb.	*.70	@	
Hexamethylene tetramine (powdered)	lb.	1.60	@	1.65
N. C. C.	lb.	.45	@	
No. 999	lb.	.18	@	

Paraphenylenediamine	lb.	*$2.60 @	$2.70
Thiocarbanilide	lb.	.45 @	.70
Velosan	lb.	*3.70 @	
Vul-Ko-Cene	lb.	.35 @	
Virol	lb.	.65 @	

ACCELERATORS, INORGANIC

Lead, dry red (bbls.)	lb.	.10¼ @	
sublimed blue (bbls.)	lb.	.08¼ @	
sublimed white (bbls.)	lb.	.08¼ @	.09
white, basic carbonate (bbls.)	lb.	.09 @	
Lime, flour	lb.	.02½ @	.03
Litharge, domestic	lb.	.09¼ @	.15
imported	lb.	*.17 @	*
sublimed	lb.	.10 @	
Magnesium, carbonate, light	lb.	.10 @	.11½
calcined extra light	lb.	.55 @	
calcined light	lb.	.30 @	
calcined medium light	lb.	.25 @	
calcined heavy	lb.	.06 @	.08
calcined commercial (magnesite)	lb.	.05 @	
oxide, extra light	lb.	.60 @	
light technical	lb.	.35 @	
light, imported	lb.	.55 @	
imported	lb.	.55 @	

ACIDS

Acetic, 28 per cent	cwt.	2.75 @	3.25
glacial, 99 per cent	cwt.	10.00 @	13.58
Aqua fortis	cwt.	6.40 @	
Cresylic (97% straw color) (bbl.)	gal.	.95 @	1.02
(95% dark) (bbl.)	gal.	.90 @	.97
Muriatic, 20 degrees	lb.	.02½ @	
Nitric, 36 degrees	cwt.	6.28 @	
Sulphuric, 66 degrees	ton	20.00 @	

ALKALIES

Caustic soda, 76 per cent (bbls.)	lb.	.03¾ @	.04
Soda ash (bbls.)	lb.	.05 @	

COLORS

Black:

Bone, powdered	lb.	.06 @	
granulated	lb.	.11 @	.15
Carbon black (sacks, factory)	lb.	.12 @	.20
pressed	lb.	.16 @	
Dipped goods	lb.	1.50 @	
Drop	lb.	.07½ @	.18
Ivory black	lb.	.18 @	.45
Lampblack	lb.	.16 @	.45
Oil soluble aniline	lb.	1.00 @	
Rubber black	lb.	.08 @	
Rubber makers' black	lb.	.40 @	

Blue:

Cobalt	lb.	.30 @	.35
Dipped goods	lb.	1.50 @	
Prussian	lb.	.82 @	
Ultramarine	lb.	.18 @	.35
Rubber makers' blue	lb.	3.50 @	

Brown:

Iron oxide	lb.	.04½ @	.06½
Sienna, Italian, raw and burnt	lb.	.06½ @	.14
Umber, Turkey, raw and burnt	lb.	.05½ @	.09½
Vandyke	lb.	.06 @	.08
Maroon oxide	lb.	14 @	

Green:

Chrome, light	lb.	.45 @	.60
medium	lb.	.50 @	.65
dark	lb.	.55 @	.70
commercial	lb.	.12 @	.20
tile	lb.	.12 @	.15
Dipped goods	lb.	1.50 @	
Oxide I. R.	lb.	.85 @	
Oxide of chromium (casks)	lb.	.70 @	.90
Rubber makers' green	lb.	3.50 @	

Red:

Antimony, crimson, sulphuret of (casks)	lb.	.45 @	
crimson, "Mephisto" (casks)	lb.	.60 @	
crimson, "R. M. P."	lb.	.55 @	.60
Antimony, golden sulphuret of (casks)	lb.	$0.27 @	$0.30
golden, "Mephisto" (casks)	lb.	.40 @	.55
golden, "R. M. P."	lb.	.25 @	
vermilion sulphuret	lb.	.65 @	
red sulphuret	lb.	.25 @	.27
Arsenic, red sulphide	lb.	.14 @	.15
Dipped goods, red	lb.	1.75 @	
purple	lb.	1.75 @	
orange	lb.	1.75 @	
Indian	lb.	.14 @	.15
Para toner	lb.	2.00 @	
Red excelsior	lb.	*.19 @	.22
Toluidine toner	lb.	3.25 @	4.25
Iron oxide, reduced grades	lb.	.05½ @	.15
pure bright	lb.	.16 @	.17
Spanish neutral	lb.	.05¾ @	.08
Venetian	lb.	.03 @	.07½
Oil soluble aniline, red	lb.	2.00 @	
orange	lb.	1.65 @	
Oximony	lb.	.18 @	
Vermilion, American	lb.	.25 @	.30
permanent	lb.	.37 @	
English quicksilver	lb.	1.00 @	1.10
Rubber makers' red	lb.	3.50 @	4.00
purple	lb.	2.50 @	

White:

Albalith	lb.	.07¼ @	.08¼
Aluminum bronze, extra brilliant	lb.	.65 @	
extra fine	lb.	.75 @	
Lithopone, Beckton white	lb.	.08 @	.08¼
Lithopone	lb.	.07¾ @	.08¼
Ponolith (carloads, factory)	lb.	@	
Rubber-makers' white	lb.	@	

Zinc oxide. American Horse Head brand (factory):

		C. L.	L. C. L.
Special	lb.	.10 @	.10½
XX red	lb.	.09¼ @	.10

French process, Florence brand (factory):

White seal	lb.	.13 @	.13¼
Green seal	lb.	.11¾ @	.12¼
Red seal	lb.	.10¾ @	.11¼
White seal, imported	lb.	.15 @	

Azo factory:

ZZZ (lead free)	lb.	.09½ @	.10
ZZ (under 5% leaded)	lb.	.08½ @	.09
Z (8-10% leaded)	lb.	.08¼ @	.08¾
Standard AA	lb.	.09 @	

Yellow:

Cadmium, sulphide, yellow, light, orange	lb.	1.80 @	
red	lb.	1.80 @	
Chrome, light and medium	lb.	.30 @	
Dipped goods	lb.	1.75 @	
Ochre, domestic	lb.	.02½ @	.05½
imported	lb.	.04¼ @	
Rubber makers'	lb.	.50 @	3.50
Zinc chromate	lb.	.49½ @	.50
Oil soluble aniline	lb.	1.75 @	

COMPOUNDING INGREDIENTS

Aluminum flake (carload)	ton	33.00 @	45.00
hydrate	lb.	.25 @	
silicate	ton	28.00 @	40.00
Ammonium carbonate (powdered)	lb.	.14 @	.15
Asbestine (carloads)	ton	35.00 @	40.00
Barium, carbonate, precipitated	ton	97.50 @	
dust	ton	110.00 @	
Barytes, pure white (f. o. b. works)	ton	28.00 @	40.00
off color	ton	20.00 @	30.00
uniform floated	ton	28.00 @	
German "Cream"	ton	45.00 @	
Basofor	lb.	.05½ @	
Blanc fixe (dry, bbls.)	lb.	.05½ @	.06¼
Bone ash	lb.	.10 @	
Carrara filler	lb.	.02½ @	
Chalk, precipitated, extra light	lb.	.04½ @	.05
heavy	lb.	.03½ @	.04
China clay, Dixie	ton	22.00 @	
Blue Ridge	ton	22.00 @	
domestic	ton	10.00 @	20.00
imported	ton	40.00 @	
Cotton linters, clean mill run, f. o. b. factory	lb.	.02½ @	.03
Fossil flour (powdered)	ton	60.00 @	
(bolted)	ton	65.00 @	
Diatomite	lb.	.03 @	

Glue, high grade	lb.	$0.35	@$0.45
medium	lb.	.30	@ .35
low grade	lb.	.20	@ .25
Graphite, flake (400-pound bbl.)	lb.	.14	@
amorphous	lb.	.04	@
Ground glass FF. (bbls.)	lb.	.05	@
Infusorial earth (powdered)	ton	60.00	@
(bolted)	ton	65.00	@
Liquid rubber	lb.	.18	@
Mica, powdered	lb.	.15	@
Pumice stone, powdered (bbl.)	lb.	.05	@
Rotten stone, powdered	lb.	.02½	@ .04½
Rubber paste	lb.	*.19	@ .22
Silica, gold bond	ton	30.00	@34.00
silver bond	ton	24.00	@28.00
Soap bark	lb.	.24	@
Soapstone, powdered gray (carload)	ton	12.00	@
Starch, powdered corn	cwt.	3.18	@ 3.76
Talc, powdered soapstone	ton	25.00	@
Terra blanche	ton	24.00	@32.00
Tripoli earth, air-floated, cream or rose (factory)	ton	50.00	@
white (factory)	ton	52.50	@
Tyre-lith	ton	110.00	@
Whiting, Alba (carloads)	cwt.	.80	@ .90
Columbia	cwt.	.95	@
commercial	ton	25.00	@
Danish	ton	22.00	@26.00
English cliffstone	ton	42.50	@
gilders	ton	40.00	@
Paris, white, American	ton	25.00	@29.00
Quaker	ton	13.00	@
Super	ton	30.00	@32.50
Wood pulp, imported	lb.	.03¼	@
XXX	ton	60.00	@
X	ton	60.00	@
Wood flour, American	ton	45.00	@

MINERAL RUBBER

Elateron (c. l. factory)	ton	55.00	@
(l. c. l. factory)	ton	58.00	@
Gilsonite	ton	60.00	@
Genasco (c. l. factory)	ton	62.50	@
(l. c. l. factory)	ton	64.50	@
Hard hydrocarbon	ton	42.00	@
Soft hydrocarbon	ton	40.00	@
K-X	ton		@
K. M. R.	ton		@
M. R. X.	ton		@
Pioneer (c. l. factory)	ton	60.00	@
(l. c. l. factory)	ton	68.00	@
Raven M. R.	ton	60.00	@65.00
Refined Elaterite	ton		@
Richmond (car load)	ton	75.00	@
No. 64 (car load)	ton	45.00	@
318/320 M. P. hydrocarbon (c. l. factory)	ton	60.00	@
(l. c. l. factory)	ton	62.50	@
300/310 M. P. hydrocarbon (c. l. factory)	ton	45.00	@
(l. c. l. factory)	ton	47.50	@
States "A" (c. l. factory)	ton	51.00	@
No. 1 (c. l. factory)	ton	42.00	@
Robertson, M. R. pulverized (c. l. factory)	ton	95.00	@
M. R. pulverized (l. c. l. factory)	ton	97.50	@
M. R. (c. l. factory)	ton	72.50	@
M. R. (l. c. l. factory)	ton	75.00	@
Rubrax (factory)	ton	50.00	@60.00
Synpro, granulated	ton	97.50	@
Walpole rubber flux (factory)	lb.		@

OILS

Avoilas compound	lb.	.17	@ .19
Castor, No. 1, U. S. P.	lb.	.13	@
No. 3, U. S. P.	lb.	.12	@
Corn	lb.	.10	@
Cotton	lb.	.10	@
Glycerine (98 per cent)	lb.	.26	@
Linseed, raw (carloads)	gal.	.81	@
Linseed compound	gal.		@
Palmoline	lb.	.14	@ .16
Palm niger	lb.	.10	@
Palm "Lagos"	lb.	.11½	@
Palm special	lb.	.17	@
Peanut	lb.	.13	@
Petrolatum	lb.	$0.06	@$0.10
Petrolatum, sticky	lb.	.08	@ .12
Petroleum grease	lb.	.07½	@ .09
Pine, steam distilled	gal.	1.40	@ 1.70
Rapeseed, refined	gal.	1.20	@
blown	lb.	.16	@
Rosin	lb.	.04	@
Synpro	gal.	.59	@ .90
Soya bean	lb.	.09	@
Tar	bbl.	16.00	@

RESINS AND PITCHES

Balsam, fir	gal.	2.00	@
Cantella gum	lb.	.50	@
Cumar resin, hard	lb.	.14	@ .18
soft	lb.	.09	@ .13
Tar, retort	bbl.	16.00	@
kiln	bbl.	16.00	@
Pitch, Burgundy	lb.	.08	@
coal tar	lb.	.01½	@
pine tar	lb.	.05	@
ponto	lb.	.14	@
Rosin, K	280 lbs.	9.50	@
strained	280 lbs.	9.50	@
Shellac, fine orange	lb.	1.50	@

SOLVENTS

Acetone (98.99 per cent drums)	lb.	.20	@
methyl (drums)	gal.	*1.50	@
Benzol (water white, 90%)	gal.	.28	@ .34
Beta-naphthol	lb.	.47	@ .48
Carbon bisulphide (drums)	lb.	.08½	@ .09½
tetrachloride (drums)	lb.	.13	@ .14
Naphtha, motor gasoline (steel bbls.)	gal.	.31	@
73 @ 76 degrees (steel bbls.)	gal.	.41	@
70@ 72 (steel bbls.)	gal.	.39	@
68 @ 70 degrees (steel bbls.)	gal.	.38	@
V. M. & P. (steel bbls.)	gal.	.30	@
solvent	gal.	.30	@
Toluol, pure	gal.	.30	@ .36
Turpentine, spirits	gal.	.74	@
wood	gal.	.70	@
Osmaco reducer	gal.	*.65	@
Xylol, pure	gal.	.45	@ .50½
commercial	gal.	.30	@ .35½

SUBSTITUTES

Black	lb.	.10	@ .18
White	lb.	.11	@ .21
Brown	lb.	.14	@ .20
Brown factice	lb.	.08	@ .20
White factice	lb.	.09	@ .20
Paragol, soft and medium (carloads)	cwt.	10.00	@
hard	cwt.	10.00	@

VULCANIZING INGREDIENTS

Lead, black hyposulphite (Black Hypo)	lb.	.29	@ .35
Orange mineral, domestic	lb.	.13¼	@
Sulphur chloride (jugs)	lb.	.20	@
(drums)	lb.	.08	@
Sulphur, flour, Brooklyn brand (carloads)	cwt.	2.65	@ 2.90
Bergenport, soft (c. l. factory)	cwt.	2.85	@
Bergenport, soft (l. c. l. factory)	cwt.	3.45	@
superfine (carloads, factory)	cwt.		@

(See also Colors—Antimony.)

WAXES

Wax, beeswax, white	lb.	.67	@
ceresin, white	lb.	.16	@
carnauba	lb.	.25	@
Montan	lb.	*.10	@
ozokerite, black	lb.	.65	@
green	lb.	.65	@
paraffine, 115° m. p.	lb.	.12½	@
120° m. p.	lb.	.12¾	@
125° m. p.	lb.	.13½	@
130° m. p.	lb.	.14½	@
Phenanthrene	lb.	.08	@ .10
Sweet wax	lb.	.15	@

* Nominal.

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